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**NEOTROPICAL ANTS COLLECTED BY**  
**DR. ELISABETH SKWARRA AND OTHERS**

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**BY WILLIAM MORTON WHEELER**

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BY WILLIAM MORTON WHEELER

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In a period of a few weeks during 1929 Dr. Elisabeth Skwarra amassed a large number of Formicidæ in the states of Vera Cruz and Morelos, Mexico, for the most part in myrmecophytes, and generously permitted me to study the whole collection. Many of the specimens belonged, of course, to well-known species and were easily identified and as promptly as possible returned to her, but several were obviously new to science or of dubious status and had to be retained for further examination. The present paper contains descriptions of this material. Pressure of other work unfortunately delayed its preparation. I apologize to Dr. Skwarra for the long delay which has unduly postponed the publication of her own much more interesting results on the ecological relations of the ants to the many myrmecophytes which she observed and collected in Mexico. To the species of Formicidæ which she obtained I have added a number collected by myself and others during earlier visits to the Neotropical Region.

Family FORMICIDÆ

Subfamily DORYLINÆ

ECITON (ACAMATUS) SUMICHRASTI Norton

Two workers (No. 113) taken by Dr. Skwarra at Mirador, Vera Cruz, apparently preying on a colony of *Azteca alfari* Emery, which was nesting in a *Cecropia mexicana*.

Owing to the fact that Mayr (1877) mentioned this species as occurring in Texas, I have for many years confused it with an unusually roughly sculptured form of *E. schmitti* Emery, which occurs also in Mexico. After examining Dr. Skwarra's specimens of the true *sumichrasti* I seriously doubt its occurrence north of the border of Mexico or indeed in the northern states of that republic. I here redescribe the insect, because the previous descriptions by Norton, Mayr and Emery are rather meager.

*Worker.* Length nearly 4 mm.

Differing from *E. schmitti* Emery, mainly in the shape of the head and postpetiole and in sculpture. Head, excluding the mandibles, nearly one and one-half times as long as broad, slightly broader in front than behind, with anteriorly rounded sides, the posterior corners

decidedly larger and longer and more produced backward than in *schmitti*, and terminating in sharp points which are turned slightly outward. The posterior border of the head is therefore deeply excised. Mandibles rather large, their external borders straight, their long terminal borders with numerous subequal denticles. Frontal carinae lobular anteriorly, closely approximated. Antennae slightly more slender than in *schmitti*; scapes somewhat longer but dilated in the same manner at their tips; funicular joints 1-6 distinctly longer than broad, 7-10 as broad as long. Thorax and pedicel much as in *schmitti*, but the postpetiole is nearly as high as long and from above more strongly trapezoidal, that is, narrower in front, where it is even narrower than the petiole, and broader behind, its dorsal surface strongly convex.

Much more coarsely sculptured than *schmitti*. Head, thorax and pedicel subopaque, densely, sharply and finely punctate, or reticulate and in addition coarsely and regularly, reticulately rugose, or foveolate; mesosterna merely densely punctate; mandibles and gaster shining, the mandibles coarsely shagreened at the base, very finely striate, with coarse, sparse punctures apically; the gaster finely and superficially shagreened, with regular, sparse, piligerous punctures. Legs, including coxae, sharply and densely punctate, appearing finely squamulose in certain lights. Under a high magnification all the punctures on the body appear as minute shining points.

Pilosity much as in *schmitti*, pale yellow, coarse, bristly, of uneven length, erect and moderately abundant on the body. As in *schmitti* there are two very long erect hairs near the anterior border of the pronotum and a few others on the occiput and anterior surfaces of the fore coxae. Hairs on the antennae and legs also rather long but somewhat more oblique.

Head, thorax and pedicel dark brownish red, almost black; mandibles, antennae, legs and gaster paler and more reddish.

#### Subfamily PONERINÆ

#### NEOPONERA LINEATICEPS Mayr

This striking and beautiful species is represented by a number of specimens taken by Dr. Skwarra from four colonies (Nos. 299, 300, 496, 593) at Mirador, Vera Cruz, in *Tillandsia streptophylla*. *N. lineaticeps* is rare in collections and seems to be rather local. It was originally described from Mexico and has been recorded by Emery from Costa Rica.

## NEOPONERA CRENATA Roger

Numerous workers and two females taken by Dr. Skwarra at Mirador from nine colonies. Eight of these (Nos. 187, 193, 199, 218, 477, 556, 661, 747) were nesting in *Tillandsia streptophylla* and one (60) in *T. dasyliriifolia*. This ant frequently nests also in hollow twigs. A considerable number of specimens from various parts of its range, which extends from Mexico to Northern Argentina, show much variation in size, sculpture and coloration and indicate need of revision of the species. *N. stipitum* Forel, of which I possess three cotype specimens, seems to be only a subspecies of *crenata*. The var. *moesta* Mayr deserves subspecific rank. Dr. Skwarra's specimens are mostly very dark, with brown or dark brown, instead of yellow legs, as in the typical form of the species, which was originally described by F. Smith as *pallipes*. ✓

## Subfamily CERAPACHYINÆ

## ACANTHOSTICHUS SKWARRE sp. nov. ✓✓

*Worker.* Length about 4.2 mm.

Small and slender, resembling *A. brevicornis* Emery. Head similar, but somewhat shorter, though distinctly longer than broad, very slightly broader in front than behind, posterior border broadly excised, posterior angles narrow as in *brevicornis*, but the frontal carinae thicker and longer, extending as far back as the middle of the head. Antennae very much like those of *brevicornis*, scapes not reaching the median transverse diameter of the head, three and one-half times as broad as long, abruptly narrower at the base. Mandibles broad, with blunt tips, differing from those of all the other described species of the genus in having the external borders distinctly concave, instead of convex. Thorax very narrow, broader in front than behind, distinctly constricted laterally in the mesoepinotal region, less flattened dorsally than in *brevicornis*, *kirbyi*, *serratulus* and *quadratus*. Base of epinotum longer than broad and longer than the steeply sloping declivity, with somewhat rounded sides. Humeral angles and margination on the sides of the thorax rather blunt, less distinct even than in *brevicornis*. Petiolar node from above nearly one and one-half times as long as broad, narrowed anteriorly, its straight sides, and the anterior border especially, bluntly marginate. Postpetiole also trapezoidal, longer than broad, much narrower in front than behind, its sides straight, its ventral portion very convex and protruding, as in the other species.

Gastric segments narrow. Legs stout, their femora and tibiae distinctly incrassated.

Smooth and shining; dorsal surface of head, especially laterally, anterior and lateral borders of thoracic segments, anterior border of petiole and dorsal surface of postpetiole and gaster with a few large, very sparse, elongate, piligerous punctures or foveolæ. Neck, epinotal declivity and anterior surface of petiolar node subopaque, punctate-rugulose, the rugules on the declivity and petiolar node longitudinal and radiating upward. Legs, especially the tibiae, with numerous small piligerous punctures.

Hairs pale yellowish, erect, very sparse and not very long on the body, shorter and more oblique on the legs; dense and numerous on the extensor surfaces of the middle and hind tibiae.

Head and thorax reddish castaneous; abdomen paler; legs yellow; clypeus dark brown; antennæ slightly paler than the head; tips of funiculi pale yellowish.

A single specimen (No. 34) from Tamarindo, State of Vera Cruz, found running on the ground.

This is the first *Acanthostichus* to be described from North America. Six species have been recorded from South America, one of them, *fuscipennis* (from Pará, Brazil) from male specimens only. Emery describes and figures this insect as differing from the male of *serratus* in having only one instead of two complete cubital cells in the fore wing. I find that of three specimens of the undescribed male of *quadratus* Emery from Brazil, in my collection, two have two complete cubital cells, while one is precisely like the male of *fuscipennis* in lacking the vein between the two cells. The latter character, therefore, seems to be of little specific importance and I am inclined to believe that Emery's *fuscipennis* may be the male of *brevicornis*. The six species of *Acanthostichus* now known from worker specimens may be separated by means of the following key:

1. External borders of mandibles concave; Length 4.2 mm. Mexico ..... *skuaræ* sp. nov.  
     External borders of mandibles convex ..... 2
2. Scapes unusually broad, being only one and one-half times as long as broad. Length 4.5-7 mm. Paraguay ..... *laticornis* Forel  
     Scapes narrower, about three and one-half times as long as broad .3
3. Head with straight, parallel sides and sharp posterior corners. Length 3.5-5.5 mm. Cayenne ..... *brevicornis* Emery  
     Head with more rounded sides and posterior corners; sides of thorax more sharply marginate ..... 4

4. Petiole from above square, as broad as long. Length 5.5-8 mm.  
Brazil ..... *quadratus* Emery  
Petiole longer than broad, trapezoidal ..... 5
5. Smaller species (maxima 5.5 mm.). Head only slightly longer than broad. Brazil ..... *serratus* F. Smith  
Larger species (5-6.5 mm.). Head distinctly longer. Frontal carinae more approximated. Brazil and Paraguay .. *kirbyi* Emery

## Subfamily MYRMICINÆ

## PHEIDOLE VASLITI Pergande var. HIRTULA Forel

Two soldiers from Cuernavaca, Morelos (No. 796), nesting "under a stone."

## PHEIDOLE SKWARRE sp. nov.

*Soldier.* Length 4 mm.

Belonging to the *biconstricta* group and related to *Ph. opaca* Mayr. Head large, one and one-fourth times as long as broad, broader in front than at the narrow posterior corners, with evenly rounded sides and very deeply and angularly excised posterior border. Occipital furrow deep, extending forward to the middle of the head. Eyes rather large, convex, situated about twice their length from the anterior corners of the head. Mandibles robust, convex, with two strong apical teeth. Antennae long and slender; scapes terete, but slightly enlarged near their tips, reaching to the posterior corners of the head; funiculi long, all their joints much longer than broad, the but slightly thickened club distinctly shorter than the remainder of the funiculus, its two basal joints together much longer than the terminal joint. Clypeus rather short, strongly carinate in the middle, its anterior border with median and lateral sinuations, its posterior border concave at the antennal foveae, which are deep. Frontal carinae short, subparallel; frontal area large, impressed, semicircular, with five equidistant carinulae. Thorax small, slender, less than half as broad as the head through the pronotum, which is as long as broad, including the neck; its dorsal surface and humeri evenly rounded; mesonotum with a prominent median torus, which is bluntly angular in profile; mesoepinotal constriction pronounced; epinotum long, its base straight and horizontal in profile, with a pair of longitudinal ridges which are continued back onto the bases of the spines. These are acute, longer than broad at their bases, but shorter than their distance apart and directed upward and backward. Epinotal declivity shorter than the

base, sloping. Petiole small and narrow, fully twice as long as broad, strongly pedunculate, the node short and high, with rounded, entire superior border. Postpetiole somewhat broader than long, less than twice as broad as the petiolar node, narrower in front than behind, with distinctly conulate sides. Gaster sub-triangular, broader behind than in front, the large first segment with rather straight sides converging to the postpetiolar insertion. Legs long and slender.

Opaque; mandibles and clypeus shining, the former evenly, sparsely and coarsely punctate, the latter punctate-rugulose in the middle and longitudinally rugose on the sides. Body, including gaster and appendages finely and densely punctate throughout, head also longitudinally rugulose, the rugules connected by reticulations on the front, the occipital lobes with coarse, shallow, piligerous punctures or foveolæ; middle of pronotum and torus of mesonotum reticulate-rugulose; upper surface of gaster and postpetiole sparsely and indistinctly foveolate.

Hairs yellowish white, moderately abundant on the head, gaster and pronotum, sparser on the petiole and postpetiole, obtuse or even dilated and flattened at their tips, almost squamate-clavate, especially on the head and pronotum; longer and pointed on the gaster, shorter and pointed on the legs, oblique and more numerous on the tibiae, scapes and funiculi.

Dark brown; scapes and legs paler brown; mandibles and antennal foveæ yellowish brown; clypeus and apical borders of mandibles blackish.

*Worker.* Length 2.5 mm.

Head nearly one and one-third times as long as broad, subelliptical, distinctly but not very strongly constricted at the occipital border, which has a raised collar. Eyes very convex, almost hemispherical, at the middle of the sides. Mandibles with straight external borders, the terminal borders with a pair of apical teeth and an even row of several basal denticles. Clypeus projecting, carinate, its anterior border with distinct median and lateral sinuations. Scapes extending nearly half their length beyond the occipital border. Thorax, pedicel, gaster and legs resembling the corresponding parts of the soldier.

Opaque and very finely punctate like the soldier but lacking the rugosity; even the mandibles and clypeus are opaque, but somewhat smoother, owing to the fineness of the punctures.

Pilosity and color very much as in the soldier, but the former sparser on the head, thorax and pedicel (partly rubbed off?). Mandibles paler, yellowish; clypeus and mandibular teeth brown.



*Female.* Length nearly 6 mm.

Head subrectangular, excluding the mandibles somewhat broader than long and nearly as broad in front as behind, with straight, transverse posterior border, the cheeks somewhat concave owing to the turning outward of the sharp anterior corners of the head. Eyes large and convex, as long as their distance from these corners. Mandibles, clypeus, frontal area and frontal carinae as in the soldier. Antennal scapes stouter, but extending more than a third their length beyond the posterior border of the head. Thorax as broad as the head through the eyes, more than twice as long as broad; mesonotum flattened above, slightly longer than broad; epinotum sloping, with stout, blunt spines. Petiole above with long, straight, flattened anterior slope, the node inclined backward and concave posteriorly, its superior border thick and rounded, very feebly emarginate in the middle. Postpetiole three times as broad as long, its sides acutely conulate. Gaster subquadrate, the very large first segment with straight, transverse anterior border.

Sculpture like that of the soldier, but coarser. Mandibles coarsely punctate-striate; rugules of clypeus and head coarser, posteriorly more reticulate and less longitudinal; pronotum transversely, middle of mesonotum longitudinally rugulose.

Pilosity as in the soldier, but less abundant on the head; the gaster in addition to the long erect hairs with short, regularly arranged, appressed hairs.

Black, with dark brown femora and paler and more reddish brown funiculi, tibiae and tarsi. Wings distinctly infuscated; veins and pterostigma dark brown.

Described from one soldier, one female and two workers taken from a single colony (No. 803) nesting under a stone at Cuernavaca, Morelos.

This is a striking species easily distinguished from any of the described forms of the *biconstricta* group of *Pheidole*.

*PHEIDOLE PUNCTATISSIMA* NAPÆA subsp. nov.

*Soldier.* Length 2.3 mm.

Decidedly smaller than the soldier of the typical *punctatissima* Mayr; head smaller, more nearly quadrate, with less rounded lateral borders; mesial borders of scrobe-like depressions more sharply indicated. Humeral tubercles of pronotum less prominent and more rounded. Cheeks and sides of front more strongly longitudinally

rugose and less reticulate. Clypeus opaque, finely and densely punctate behind, like the head. Mandibles, scapes, first gastric segment and femora dark brown; gula, clypeus, anterior portion of head, thorax and pedicel black; remainder of dorsal portion of head somewhat darker and more brownish yellow than in the typical form of the species. Obtuse pilosity of the body somewhat shorter.

*Worker.* Length 1.5 mm.

Smaller than the worker of the typical *punctatissima*, with somewhat smaller and more slender epinotal spines. Rugules on the cheeks much less distinct. Color darker brown, with darker femora and distinctly infuscated scapes and funiculi.

One soldier and three workers (51a) taken by Dr. Skwarra at Mirador, Vera Cruz, running on the bark of a guava.

*PHEIDOLE FLORIDANA TILLANDSIARUM* subsp. nov.

*Soldier.* Length 2-2.3 mm.

Distinctly smaller than the soldier of the typical *floridana* Emery, with shorter and more rectangular head, which is not longer than broad, without the mandibles. Torus of mesonotum smaller and more acute in profile; epinotal spines shorter and more slender. Rugæ of the clypeus and head decidedly coarser and on the latter extending much further back so that only a small portion of the occipital lobes is smooth and shining. Thorax and petiole also more sharply rugulose-punctate or reticulate and less shining. Gaster smooth and shining throughout as in the typical *floridana*. Color darker, being deep ferruginous, the appendages and gaster more brownish yellow, the dental margin of the mandibles and anterior border of clypeus blackish.

*Worker.* Length 1.3-1.5 mm.

Not larger than the worker of *floridana* but with somewhat shorter head and darker coloration as in the soldier. The dense punctulation of the head and thorax is somewhat coarser and deeper.

Described from a number of soldiers and workers (Nos. 201 and 218), taken by Dr. Skwarra at Mirador, Vera Cruz, nesting in *Tillandsia streptophylla*.

*PHEIDOLE FLORIDANA ÆCHMÆ* subsp. nov.

*Soldier.* Length about 2.3 mm.

Resembling the subspecies *tillandsiarum* but more robust, with distinctly larger head and broader thorax, the occipital excision quite as deep but more sinuately rounded in the middle, the frontal area

larger and less clearly defined. Clypeus flat, distinctly carinate in the middle. Epinotum broader than long, its base in profile shorter than the declivity. Nearly the whole of the posterior third of the head shining and without rugæ, but conspicuously, sparsely and obliquely foveolate. Slightly deeper ferruginous than *tillandsiarum*, with the occipital lobes darker, the apical half of the gaster dark brown, the base and anal region yellow. Pilosity similar but distinctly more abundant, especially on the head.

*Worker.* Length about 1.5 mm.

Very similar to the worker of *tillandsiarum* but the antennal scapes longer, extending fully twice their greatest diameter beyond the posterior border of the head. Color of head, thorax and pedicel somewhat darker and more brownish.

A single soldier and three workers from Camaron, near Mirador, Vera Cruz (No. 472), found by Dr. Skwarra in *Echmea bracteata*.

This and the preceding subspecies are quite distinct from any of the described forms of *floridana* (*floridana* sens. str., *deplanata* Pergande, *ares* Forel, *antoniensis* Forel, *stomachosa* Wheeler), of all of which I possess cotypic specimens.

#### PHEIDOLE TRAGICA sp. nov.

*Soldier.* Length nearly 3 mm.

Belonging to the *flavens* group. Head large, subquadrate, slightly broader in front than behind, with straight sides, feebly concave cheeks, pronounced anterior corners and deeply, angularly excised posterior border; vertex somewhat depressed in the region of the occipital groove, which is deep and extends forward to the middle of the head. There are no traces of scrobe-like depressions. Eyes moderately large and convex, situated less than twice their length from the anterior corners of the head. Mandibles very convex, with two coarse apical teeth. Clypeus smooth and ecarinate in the middle, its anterior border with a median but no lateral sinuations. Frontal area large, subtriangular, smooth, not deeply impressed; frontal carinæ straight, posteriorly diverging, only half as long as the antennal scapes, which are somewhat flattened at the base and reach half the distance between their insertions and the borders of the occipital lobes. Funicular joints 2-8 subequal, longer than broad; club shorter and stouter than the remainder of the funiculus, its enlarged terminal joint nearly as long as the two preceding, subequal joints together. Thorax stout; pronotum with rather acute but not prominent humeri, forming with

the mesonotum a subhemispherical mass, the mesonotum with a small transverse ridge, or torus, descending to the deep mesoepinotal constriction; epinotum as broad as long, with subequal base and declivity, the former in profile horizontal, the latter sloping, the spines longer than their basal width, shorter than their distance apart, acute, directed upward, backward and slightly outward. Petiole about one and one-half times as long as broad, nearly parallel-sided, the node narrow, anteroposteriorly compressed, with long, concave anterior and short, abrupt posterior declivity, the superior border blunt, rounded and entire. Postpetiole subtrapezoidal, broader than long and than the petiole and broadest at the anterior border, where it is produced on each side as a prominent angle. Gaster much smaller than the head, broadly elliptical and dorsoventrally compressed. Femora distinctly incrassated.

Shining; mandibles smooth, with sparse, coarse, piligerous punctures; anterior border of clypeus with a few transverse rugæ, sides longitudinally rugose; anterior half of head sharply longitudinally rugose, the rugæ on the cheeks connected by indistinct reticulations; posterior half of head smooth and shining, with large, scattered piligerous punctures or foveolæ, the occipital excision finely reticulate and transversely rugulose. Thorax and ventral portions of petiole densely punctate, the pro- and mesonotum smooth in the middle, with a few longitudinal rugules; base of epinotum with a few short longitudinal rugæ anteriorly; node of petiole, postpetiole, gaster, legs and scapes smooth and shining, with sparse piligerous punctures.

Hairs yellowish, rather abundant, long, erect or suberect, pointed and of unequal length on the body, shorter and more oblique on the appendages; anterior surfaces of scapes with a few long erect hairs.

Piceous black; mandibles, except their terminal borders, the cheeks and the tarsi brownish yellow; gula, legs and bases of funiculi dark brown.

*Worker.* Length 1.6 mm.

Head subrectangular, as long as broad, with rounded sides and feebly emarginate posterior border. Mandibles with straight external borders, two larger apical and four smaller basal teeth. Clypeus distinctly carinate, its anterior border medially sinuate. Antennæ slender; scapes extending about one-fifth their length beyond the posterior border of the head. Eyes a little in front of the middle of its sides. Thorax and petiole resembling those of the soldier, the small postpetiole rounded, broader behind than in front, without anterolateral angles. Legs more slender.

Sculpture like that of the soldier, except that the head is smooth and shining in the middle, finely and superficially reticulate behind and delicately, sparsely and longitudinally rugulose on the sides. Thorax and petiole uniformly and densely punctate, the pronotum dorsally somewhat rugulose.

Pilosity sparser than in the soldier, the hairs on the thorax and pedicel obtuse, those on the head reclinate.

Dark piceous brown or black, with brown legs and antennæ; mandibles and tarsi yellowish.

A single soldier and three workers (No. A39) taken by Dr. Skwarra at Pedregal, near Mexico City.

*PHEIDOLE SAGANA* sp. nov.

*Soldier.* Length 2.5–2.8 mm.

Belonging to the *flavens* group and related to *Ph. dimidiata* Emery. Head moderately large, slightly longer than broad, broader behind than in front, with nearly straight, anteriorly converging sides, the posterior corners rather narrowly rounded, the posterior border broadly, deeply and sinuately excised. Eyes small, rather flat, situated twice their length from the anterior corners of the head. Mandibles large, convex, with two large apical and two smaller basal teeth. Teeth on the mentum well-developed, acute. Clypeus short, flat and sharply carinate, its anterior border sinuate in the middle and less deeply on each side. Antennal scapes curved but not flattened at the base, their tips reaching about half the distance between their insertions and the posterior corners of the head; funicular joints 2–8 as broad as long; clubs swollen, as long as the remainder of the funiculus, terminal joint large, pointed, as long as the two preceding joints together. Frontal area subtriangular, impressed, with median carinula; frontal carinæ strongly diverging behind; as long as the scapes and forming the mesial borders of flattened, somewhat scrobe-like areas. Pronotum short and broad, with prominent, subangular humeri; mesonotum anteriorly flattened and subtriangular, separated by a transverse swelling, or torus from the posterior portion, which slopes more steeply to the deep and rather long mesoepinotal constriction. Epinotum as broad as long, its base in profile straight and horizontal, as long as the sloping declivity; spines slender, acute, longer than broad at the base and shorter than their distance apart, directed backward and somewhat upward. Petiole slender, twice as long as broad, its peduncle parallel-sided, its node small, transversely conical.

Postpetiole broader than the petiolar node, slightly broader than long, subtrapezoidal, broadest at the anterior corners which are rounded and not produced. Gaster smaller than the head, broadly elliptical, dorsoventrally compressed. Femora distinctly incrassated; tibiae clavate.

Shining; mandibles small, with scattered piligerous punctures; clypeus smooth in the middle, longitudinally rugose on the sides; anterior two-thirds of head sharply longitudinally rugose, except the anterior half of the narrow scrobe-like areas, which are reticulate rugulose; posterior third of head smooth and shining, with scattered piligerous punctures like those on the mandibles. Sides of thorax, whole epinotum and petiole, except the summit of the node, more opaque, finely and densely punctate; pro- and mesonotum more shining above, irregularly and loosely rugulose, the former anteriorly with several transverse rugae. Postpetiole superficially reticulate above, with several short longitudinal sulci. Gaster and legs smooth, with fine, sparse, piligerous punctures; antennal scapes reticulate.

Hairs yellowish, bristly, pointed, long and erect, rather sparse on the posterior border of the head, the thorax and abdomen; shorter and oblique on the appendages; scapes with a few long erect hairs on their flexor borders.

Deep castaneous brown; appendages and base of first gastric segment very slightly paler; mandibles, except their terminal borders, front, cheeks, neck, tips of scapes and basal funicular joints reddish yellow.

*Worker.* Length 1.3-1.5 mm.

Head subrectangular, scarcely longer than broad, with feebly rounded sides and medially emarginate posterior border. Eyes moderately convex, near the middle of the sides. Mandibles with straight external borders, the terminal borders with two large apical teeth and four or five rather indistinct basal denticles. Clypeus moderately convex, carinate, its anterior border with feeble median and deeper lateral sinuations. Frontal area distinct, not impressed; frontal carinae fully half as long as the scapes, continued back beyond the middle of the head and bounding distinct scrobe-like areas. Antennal scapes extending slightly beyond the posterior border of the head. Thorax resembling that of the soldier; pronotum distinctly flattened above, with acute humeral angles; mesonotum rounded, sloping, without distinct torus. Epinotum about as broad as long, somewhat widened behind the base, in profile straight, distinctly longer than the declivity; spines resembling those of the soldier but

smaller. Petiole very slender, nearly three times as long as broad, with small, subconical node. Postpetiole only slightly broader than the petiole, rounded subquadrate, nearly as long as broad. Gaster subrectangular, a little broader behind than in front, the anterior border straight and transverse forming distinct angles with the sides.

Shining; mandibles and median portion of the clypeus smooth, the former with coarse, scattered punctures. Frontal area reticulate; front smooth and shining, its sides and the sides of the head with sparse, interrupted, longitudinal rugæ, the scrobal areas between finely reticulate-rugulose. A similar but more pronounced sculpture covers the thorax and pedicel; upper surfaces of the petiolar and postpetiolar nodes smooth and shining, as are also the gaster and legs.

Pilosity like that of the soldier but shorter. Color dark brown; the thorax, pedicel, legs and base of first gastric segment paler; mandibles, tarsi, tips of scapes and basal joints of funiculi pale yellow.

Described from eight soldiers and eight workers from three colonies (Nos. 149, 150, 518) taken by Dr. Skwarra at Mirador, Vera Cruz, in *Tillandsia streptophylla*.

#### CREMATOGASTER (ORTHOCREMA) SCULPTURATA Pergande

*Worker.* Length 2.2-2.4 mm.

Head subcircular, as broad as long, with convex sides, rounded posterior corners and short, convex posterior border, the eyes round and convex, placed just behind the middle of the sides. Mandibles narrow, with four small, subequal teeth. Clypeus convex, with four longitudinal carinæ, the median pair longer and converging anteriorly to the straight, entire anterior border. Frontal area large, triangular not very distinctly bounded posteriorly. Frontal carinæ subparallel, much farther apart than their distance from the lateral borders of the head. Antennæ rather long; scapes curved at the base, their tips extending somewhat beyond the posterior border of the head; funiculi with 2-jointed club; joints 2-8 small, subequal, the second joint distinctly longer than broad, 3-8 very nearly as broad as long; basal joint of club nearly twice as long as broad, about half as long as the more swollen terminal joint. Thorax shaped as in *C. curvispinosa* Mayr, rather stout, broad through the pronotum, strongly constricted in the mesoëpinotal region, with broad epinotum; promesonotum as broad as long, the pronotum with prominent rounded humeri, the promesonotal suture absent; mesonotum with a pair of prominent longitudinal carinæ which are subdentate anteriorly and extend

posteriorly to the bases of epinotal spines; general surface of the mesonotum sloping posteriorly to the sharp constriction; epinotum without the spines twice as broad as long, its short base and much longer sloping declivity meeting at a distinct transverse ridge, the spines like those of *C. curvispinosa*, stout and flattened at the base, acute apically, nearly as long as their distance apart at the base, spreading laterally, curved inward and directed upward and backward. Petiole shaped as in *curvispinosa*, somewhat flattened above, as broad as long, with straight, parallel sides and semicircularly rounded anterior border, the posterior corners produced as distinct, blunt teeth, which are as long as broad at their bases. Postpetiole ovoidal, somewhat broader than long, convex above, without median furrow. Gaster large, acutely pointed behind and with the postpetiolar insertion rather far back, the inferior, anterior border straight and transverse. Legs slender.

Shining; mandibles smooth, sparsely punctate; clypeus smooth, except for the carinae, its lateral wings transversely, cheeks longitudinally and more coarsely striated. Antennal scapes striate. Front, vertex and occiput very smooth and shining, with very sparse punctures; sides of front with fine rugules, space between these and the eyes densely punctate, or finely reticulate-rugulose. Promesonotum sharply, coarsely and somewhat longitudinally reticulate-rugose, the meshes of unequal size and distinctly asymmetrical on the two sides. Base of epinotum with about 6 short, parallel, longitudinal rugules, becoming reticulate posteriorly, bases of spines rugulose; posterior portions of sides of pronotum and declivity of epinotum very smooth and shining, neck and remainder of sides of thorax densely and evenly punctate, as are also the ventral portions of the petiole and postpetiole, though more finely; dorsal surface of these segments shining, that of the petiole finely longitudinally sulcate. Gaster smooth and shining, with sparse, regular, piligerous punctures.

Hairs white, stiff, erect and pointed, very regularly arranged, sparse on head and thorax, longer on the head and gaster than on the thorax and pedicel, where they are microscopically serrate. Anterior borders of scapes with four or five long erect hairs; otherwise the appendages have numerous short, appressed hairs; they are more oblique on the funiculi. Pubescence pale, long and very sparse, visible on the head and gaster.

Castaneous brown; head behind and posterior portion of gaster darker; mandibles, bases of scapes, trochanters, and tarsi brownish yellow.



Tepic, Mexico (Eisen and Vaslit)

I have redescribed this species from a cotype specimen in my collection, because Pergande's description is rather meager and because I am introducing below two subspecies and an allied species. It is very closely related to *C. curvispinosa* of Brazil. I have not seen specimens of this species, but Mayr's description and figure of the type from Rio Janeiro agree well with *sculpturata*, except in color.

CREMATOGASTER (ORTHOCREMA) SCULPTURATA PHYTÆCA  
subsp. nov.

*Worker.* Differing from the typical species as follows: epinotal spines decidedly more slender, less flattened and more tapering, in profile more erect and recurved; teeth at the posterior corners of the postpetiole stouter and more acute; gaster more voluminous. Shining frontal and vertical area of head more extensive; spaces between the coarse rugæ on the pronotum more or less reticulate-rugulose especially at the sides; base of epinotum more irregularly rugulose, the declivity and the postpetiole subopaque and very finely and superficially punctate. Color jet black or deep piceous black, with brown mandibles and antennæ, which often have the distal portion of the scape and the club black or dark brown; trochanters and tarsi whitish yellow, the last joint of the latter brown. Pilosity like that of the typical *sculpturata*, but the appressed hairs on the legs seem to be less numerous.

*Female.* Length 3.5-4 mm.

Head much more subrectangular than in the worker, distinctly broader than long and slightly broader behind than in front; with nearly straight or feebly sinuate posterior border. Eyes elliptical, nearly one third as long as the sides of the head; antennal scapes scarcely reaching beyond its posterior border. Thorax of the usual shape, more than twice as long as broad; the anteriorly convex mesonotum fully one and one half times as long as broad; epinotum similar to that of the worker, but the spines are much shorter and though distinctly longer than broad at their bases, variable in thickness. Petiole and gaster like those of the worker, the former somewhat longer than broad, with well-developed peduncle, the latter larger and especially longer in proportion to its width; postpetiole also decidedly larger and broader, with very bluntly subconulate sides.

Clypeus and head, except the occipital surface, sharply, but rather finely longitudinally rugose, the rugæ fewer and more delicate on the

front and vertex. Mesonotum and scutellum coarsely and sparsely punctate and also longitudinally rugulose, the rugules on the former denser at the sides and behind; base of epinotum regularly, longitudinally rugose, declivity and pro- and mesopleuræ nearly smooth.

Pilosity and color as in the worker, but the stiff obtuse hairs on the thorax are more numerous and irregularly arranged. Wing-membranes distinctly brownish; veins and pterostigma darker brown.

*Male.* Length 2-2.5 mm.

Head through the very large, convex, anteriorly placed eyes nearly as long as broad, semicircular behind, with prominent ocelli; cheeks short and straight. Mandibles small and slender, their tips obscurely tridentate. Clypeus short and broad, moderately convex, its anterior border nearly straight, entire. Scapes slightly more than twice as long as broad; first funicular joint broader, globular; terminal joint long, slender, with tapering point; remaining joints much shorter and stouter, though distinctly longer than broad. Mesonotum broader than long, subtriangular, narrowed and very convex anteriorly where it overarches the small pronotum. Epinotum short and small, unarmed, in profile with subequal, indistinctly separated, rounded base and declivity. Petiole small, anteriorly narrowed, its posterodorsal surface convex. Postpetiole somewhat broader than the petiole, broader than long, rounded and subnodiform above. Gaster shaped somewhat as in the worker; genitalia large and protruding. Legs slender.

Shining, with small sparse, piligerous punctures; mesonotum and scutellum longitudinally striate, the latter more coarsely.

Pilosity white, rather delicate, sparse and moderately long on the body; shorter, more abundant and oblique on the appendages, more nearly erect on the antennæ than on the legs.

Piceous brown; mandibles, mouthparts, antennæ, legs and genitalia pale brownish yellow; wings paler than in the female, whitish; veins and pterostigma pale brown.

Described from numerous specimens representing colonies taken by Dr. Skwarra in the following localities and plants:

Mirador (type-locality), in *Tillandsia streptophylla* (Nos. 213, 519, 550, 606); in *T. dasyliriifolia* (362); in *T. Balbisiana* (620, 651); in *Conostegia xalapensis* (209a, 209b); in internodes of *Cecropia Schiedeana* (253); in hollow stems (564).

Tamarindo; in thorns of *Acacia sphaerocephala*.

Camaron; in *T. Balbisiana* (675, 688); in *T. pruinosa* (628a); in pseudobulbs of *Schomburgkia tibicinis* (479).

There is among the material from Mirador (209a) a single ergato-

morphic female measuring nearly 3 mm. Its head is like that of the normal female in size and shape, but the eyes and ocelli are much smaller. The thorax is like that of the worker but larger and more robust with small, sharply delimited mesonotum of the female type, and broad, short, flat, acute, epinotal spines. Petiole, postpetiole and gaster also as in the worker but much larger. The mesonotum and base of the epinotum are longitudinally rugulose, the former very finely, the latter coarsely and regularly. Pilosity as in the normal worker. Tibiæ and antennæ brownish yellow like the tarsi, the antennal club deeply infuscated. In other respects the color is like that of normal females and workers.

CREMATOGASTER (ORTHOCREMA) SCULPTURATA ACCOLA subsp. nov.

*Worker.* Differing from the two preceding forms in having the head more subrectangular, and in larger specimens distinctly broader than long, and in the mesonotal carinæ, which are much more prominent, with larger blunt anterior teeth, which are connected by a distinct transverse ridge or crest, so that the mesonotum rises anteriorly above the posterior border of the pronotum. The epinotal spines are like those of the typical *sculpturata*, but even broader and flatter in some specimens, with short and more rapidly tapering, acute tips. The teeth of the petiole are prominent, subacute and longer than broad at their bases. The sculpture is also peculiar, the head and thorax being sharply, regularly and finely reticulate. On the head this reticulation is overlaid by longitudinal rugules, even on the front and vertex, so that the whole surface is subopaque and without a smooth, polished median area like that of *sculpturata* and *phyteca*. The very strong network of rugæ is present on the pronotum as in these forms. Postpetiole and sides and ventral portions of the petiole sharply and densely punctate. Pilosity and coloration as in *phyteca*.

Described from eleven workers taken by Dr. Skwarra from four colonies at Mirador, two of them (595 and 662) nesting in *Tillandsia streptophylla* and two (13 and 104) in *Conostegia xalapensis*.

CREMATOGASTER (ORTHOCREMA) AGNITA sp. nov.

*Worker.* Length 2-2.8 mm.

Closely related to *sculpturata* but clearly distinct. Head subrectangular, in the largest individuals broader than long, structurally in other respects as in *sculpturata*, except that the clypeus has four longitudinal carinæ or rugæ on each side. Thorax, petiole and post-

petiole very similar, but the epinotal spines are shorter, straight, not spreading laterally but subparallel and directed only backward and upward. Carinae of the mesonotum sharp but not dentate anteriorly. Posterior teeth of the petiole distinct, acute, shorter than their width at the base.

Sculpture similar to that of the subspecies *accola*, but the front and vertex more shining, without rugules but superficially reticulate. Rugae on the pronotum sharp but less coarse than in *sculpturata* and its subspecies; mesonotum merely finely reticulate and the same is true of the upper surface of the petiole. Postpetiole with a similar sculpture and with traces of longitudinal impressed lines or sulci. Gaster superficially reticulate and not very shining; antennal scapes striate as in *sculpturata* and its subspecies.

Pilosity much as in these forms, but the hairs are yellowish on the body, coarser, more obtuse and somewhat shorter, distinctly more abundant on the gaster. The long, erect hairs on the anterior borders of the scapes of *sculpturata* and its subspecies are lacking.

Dull yellowish brown or brownish yellow, with paler and more yellow legs and antennae; head sometimes darker behind; gaster, except at its base, castaneous, with the posterior borders of the segments yellowish.

*Female* (deilated). Length nearly 5 mm.

Head resembling that of the worker, but the larger eyes are at the middle of the sides and fully one third as long. The epinotal spines are stout and acute, longer than broad at their bases, the petiole not longer than broad and the denticles at the corners of its straight and transverse posterior border minute. Postpetiole longer in proportion to its length than in the female of *phyteca*, rounded and not subconulate laterally.

Finely and densely shagreened, with the exception of the front, vertex, scutellum, legs and sides of the pro- and mesothorax, which are smooth and more shining. Dorsal surface of body sparsely and coarsely punctate. Mandibles and scapes longitudinally striate; cheeks and sides of front longitudinally rugose; sides of epinotum somewhat concentrically rugose.

Pilosity like that of the worker but more abundant and less regularly arranged on the head and thorax; appendages with short, more or less oblique hairs or pubescence.

Brownish yellow; head often slightly darker; gaster reddish brown, with yellowish posterior borders to the segments.

Described from numerous workers and a single female which I took

from hollow twigs Dec. 12, 1911 at Zacapa, an uncommonly arid locality in Guatemala.

*PROCRYPTOCERUS STRIATUS SCABRIUSCULUS* Emery

Workers from seven colonies all taken in hollow stems at Mirador (270a, 276, 420, 398, 709, 335a, 435).

*STRUMIGENYS (CEPHALOXYS) SKWARRE* sp. nov.

*Worker.* Length: 1.5-1.7 mm.

Closely related to *S. clypeata* Roger of the United States but quite distinct. Form and proportions of the head and clypeus as in that species. Antennal scapes broader and more dilated beyond their slender bases; second funicular joint distinctly longer than broad, third as long as broad. Mandibles longer, and more gradually tapering than in *clypeata*, on their internal ventral borders with a broad lamella, which is bluntly subdentate at the middle, beyond the anterior border of the clypeus; the teeth at the tip about 10 in number, spiniform, crowded and of unequal length. Thorax of the usual shape, in profile evenly and feebly arcuate; humeri rounded; pronotum without median carina, with promesonotal suture obsolete and replaced by a distinct semicircular impression; mesoepinotal suture distinct; epinotal spines slender and acute, directed backward, each with a broad spongiform lamella extending along its whole posterior border and down the side of the epinotal declivity. Petiolar and postpetiolar nodes transversely elliptical, the latter one and one-half times as broad as the former, with well-developed spongiform masses on their ventral and lateral surfaces.

Mandibles somewhat shining, very finely punctate; head, thorax and petiole opaque, densely and evenly reticulate-rugulose, the clypeus more finely; gaster and exposed dorsal surface of postpetiolar node smooth and shining, the former with the basal third of the first segment loosely striate. Legs and scapes opaque, very finely reticulate-rugulose.

Hairs white; curved and clavate-squamate on the clypeus, scapes, dorsal surface of head, thorax, pedicel and gaster, most abundant on the head, decidedly longer and sparser on the pedicel and gaster. Those forming a row on the anterior borders of the clypeus and a series of about 10 on the anterior borders of the scapes are curved forward. Hairs on the ventral surface of the gaster sparse and of ordinary structure.

Yellowish ferruginous, middle portion of gaster and borders of petiolar and postpetiolar nodes dark brown.

Described from 15 specimens representing four colonies, all taken by Dr. Skwarra in *Tillandsia streptophylla* in two localities: Tlacocintla (type locality; 487 and 494) and Mirador (153 and 290).

#### SERICOMYRMEX AZTECUS Forel

Two workers, one from Mirador (477), found dead in nest of *Pheidole punctatissima* in pseudobulb of *Schomburgkia tibicinis*, and one from Tlacocintla (529) running on ground.

#### Subfamily DOLICHODERINÆ

##### IRIDOMYRMEX PRUINOSUS Roger

Three workers (No. 84) taken by Dr. Skwarra under a stone at Remutadero, Mexico, are smaller than Cuban specimens of the typical form and have the gaster pale yellow, except at the tip. They probably represent a variety transitional to the widely distributed var. *analisis* Ern. André.

##### TAPINOMA RAMULORUM Emery

I have taken this species frequently at San Jose, Costa Rica, nesting in dry twigs of various trees. Emery's specimens were found in the same locality in dry twigs of the "tuete" (*Vernonia brachiata* Benth). In addition to a new variety of *T. inrectum* Forel, which I regard as a subspecies of *ramulorum*, Dr. Skwarra has discovered two other forms and I am able to add a subspecies from Costa Rica.

The examination of this material shows that *ramulorum* and at least two of its subspecies have distinctly dimorphic females. One of them is of the usual type, with well-developed wings, the other a microgyne distinguished by the peculiar shape of its head, its less robust thorax and minute wings, with greatly reduced venation. Most of my specimens are dealated, but one microgyne of *inrectum* var. *subnigrum* var. nov. retains a fore wing and one of *ramulorum* (sens. str.) a hind wing. The two types of female of the typical *ramulorum* may be distinguished as follows:

*Macropterous female.* Length 3.6-3.8 mm.

Head without the mandibles scarcely longer than broad, broader behind than in front, with straight posterior border and rather con-

ves sides. Antennae stout, scapes, extending about one and one-half times their greatest diameter beyond the posterior border of the head. Eyes rather large and convex, more than one fourth as long as the sides of the head. Thorax twice as long as broad and nearly as broad as the head through the eyes; mesonotum and scutellum flattened, the former fully as broad as long, the latter about one and one-half times as broad as long; base of epinotum in profile short, about one-third as long as the sloping declivity. Thorax with sparse, pale, erect hairs on its dorsal surface. Gastric segments with grayish yellow borders not sharply marked off from the dark brown basal portions. Scapes of antennae dark brown. (Twelve dealated specimens).

*Micropterous female.* Length 3.-3.3. mm.

Head smaller, distinctly longer than broad, sub-oblong, with straight, subparallel sides and straight posterior border, which is not surpassed by the antennal scapes. Eyes and ocelli distinctly smaller than in the macropterous female, the former only one-fourth as long as the sides of the head. Thorax smaller and narrower, more than twice as long as broad; mesonotum and scutellum also distinctly smaller and narrower; epinotum evenly rounded, without distinct base and declivity. Gaster proportionally smaller and narrower than in the macropterous female. Hind wing elliptical, not longer than the head, with a single median vein. Erect hairs absent on thorax. Color paler brown than in the macropterous female; gaster yellow, with a broad brown band across each segment. Scapes pale yellow, like the tibiae. (Six specimens, all completely dealated except the one bearing a hind wing).

*TAPINOMA RAMULORUM* var. *SATULLUM* var. nov.

*Worker.* Differing from the typical form of the species in its decidedly darker color, the head, thorax, gaster, median portions of femora and in some specimens also the distal portions of the antennal scapes being much darker brown, almost black. Outer border and base of mandibles black as in the typical *ramulorum*.

Specimens from five colonies collected at Mirador (type-locality): two from *Tillandsia streptophylla* (Nos. 147, 325), one from internodes of *Cecropia mexicana* (176), one from a hollow twig of coffee (294 a), one from under the leaf-base of *Musa* (270); and a single colony (479) taken at Camaron in a pseudobulb of *Schomburgkia tibicinis*. Two males from Mirador (325) agree with Emery's description of the male of the typical *ramulorum*, except that their wings have complete discoidal cells.

## TAPINOMA RAMULORUM TOLTECUM subsp. nov.

*Worker.* Very similar in size and coloration to the var. *satullum* but the scapes show no traces of infuscation and the surface of the head and thorax is more opaque and more distinctly punctulate. The scapes and funiculi are decidedly shorter, the former extending not more than their greatest diameter beyond the posterior border of the head and the latter with all the joints shorter, the second being nearly twice as broad as long, the remaining joints except the last, only slightly longer than broad. In the typical *ramulorum* the second funicular joint is as long as broad, the succeeding joints fully one and one-third times as long as broad. The legs of *toltecum* are also shorter and the body somewhat stouter.

Described from nine specimens taken by Dr. Skwarra at Mirador (No. 41) in *Tillandsia Balbisiana*.

## TAPINOMA RAMULORUM INRECTUM Forel

This subspecies seems to be widely distributed in Middle America. I have taken the workers in the cauline swellings of *Cordia alliodora* on Barro Colorado Island, Panama (Aug. 2, 1924) and in dead twigs at Escuintla, Guatemala (Dec. 30, 1911), and Dr. A. Petrunkevitch has sent me specimens which he found "nesting on the leaf of a tree", presumably in a carton nest, at La Buena Ventura, Chiapas, Mexico, Aug. 13, 1909. All these specimens agree closely with Forel's description of the types from the Forest of Pirris, Costa Rica. The antennal scapes extend nearly one-third their length beyond the posterior border of the head and the second funicular joint is longer than broad. The thorax is somewhat more slender than in the preceding forms of *ramulorum* and the legs somewhat longer. The thorax is brown, the head darker brown, the gaster paler and more yellowish, nonfasciate, the mandibles and antennæ pale yellow throughout, the legs pale yellow, with the femora brown in the middle.

## TAPINOMA RAMULORUM ANNELLATUM subsp. nov.

*Worker.* Length 2-2.3 mm.

Differing from the workers of the preceding forms as follows: Body and especially the head and thorax densely punctate and opaque, the gaster paler than in the typical *ramulorum*, dull brownish yellow, with a pale brown transverse band on the middle of each segment;



femora pale brown in the middle and the dark portion of the mandibles reduced to a triangular brown spot at the external corner of the base. The antennal scapes are as long as in the typical *ramulorum* but the funiculi are stouter, with shorter joints, the second being distinctly broader than long.

*Macropterous female.* Length 3.2-3.5 mm.; wings nearly 4 mm.

Smaller and much paler than the macropterous female of the typical *ramulorum*. Head small, without the mandibles fully as broad as long and shaped as in *ramulorum*. Thorax larger, much broader than the head, decidedly less than twice as long as broad; pronotum as broad as long, scutellum twice as broad as long. Thorax and gaster pale brown, the head blackish only posterodorsally, the mandibles, clypeus, cheeks, gula, scapes and legs pale yellow, the funiculi beyond the first joint and the median portions of the femora brownish. Posterior borders of gastric segments yellowish. Wings subopaque, grayish, iridescent; veins and pterostigma brownish yellow. Head as well as the thorax with pale, erect hairs above.

*Micropterous female* (deälated). Length 3 mm.

Head suboblong, longer than broad, with straight subparallel sides and posterior border. Antennal scapes not quite reaching the latter; funicular joints, except the first and last, broader than long. Eyes and ocelli distinctly smaller than in the macropterous female. Thorax much smaller and narrower, narrower than the head, and fully twice as long as broad; mesonotum one and one-third times as long as broad, narrowed behind; scutellum small, nearly as long as broad; epinotum longer than in the macropterous female. Color as in that form but the body is darker brown and the fasciæ on the gaster are more pronounced; mandibles blackish externally at the base. Head and thorax without erect hairs.

Described from a dozen workers, one micropterous and three macropterous females which I found in dead twigs at Cartago, Costa Rica, Dec. 6, 1911.

*TAPINOMA RAMULORUM INRECTUM* Forel var. *SUBNIGRUM* var. nov.

*Worker.* Length 1.7-2 mm.

Differing from the typical *inrectum* in color, the body being deep piceous brown, the head and gaster often black; scapes and distal portions of funiculi sometimes brownish; median portions of femora dark brown; remainder of appendages and the petiole pale, yellowish white; mandibles somewhat brownish.

*Macropterous female* (deälated). Length 2 mm.

Smaller than the macropterous females of the typical *ramulorum* and the subsp. *annellatum*, but the head is of the same shape. Antennal scapes reaching to its posterior border; joints 2-10 of the funiculi as broad as long. Thorax slightly narrower than the head, twice as long as broad; mesonotum as broad as long, scutellum broader than long; epinotum sloping and rounded as in the worker. Dorsal surface of thorax with short, erect hairs. Color much like that of the worker.

*Micropterous female.* Length 1.8 mm.

Head smaller, somewhat narrower and more rectangular than in the macropterous female but distinctly broader behind than in front; eyes and ocelli smaller, funicular joints shorter. Thorax smaller and narrower, very distinctly narrower than the head; mesonotum much smaller but broader than long; scutellum proportionally longer. Anterior wing only as long as the head plus the mandibles, elliptical, with three stout longitudinal veins and a stout costa. Thorax not distinctly hairy above. Sculpture and color as in the macropterous female.

This variety is represented in Dr. Skwarra's material by numerous workers, a macropterous and a micropterous female from seven colonies: one from Camaron (No. 402), taken from a hole left by a broken branch, and six from Mirador (type locality), taken in the following situations: No. 504 in reed; 452 in a stick, 339 in *Tillandsia fasciculata*; 293 in *T. Valenzuelana*; 611b in *T. streptophylla* and 295 in *Conostegia xalapensis*.

The genus *Tapinoma* appears to be well represented in tropical America. I append descriptions of three undescribed species and a subspecies which have been standing for some years in my collection.

#### TAPINOMA PANAMENSE sp. nov.

*Worker.* Length 1-1.2 mm.

Head subrectangular, longer than broad, as broad in front as behind, with very feebly convex sides, straight posterior border and rounded posterior corners. Eyes small, flat, placed about one and one-half times their length from the anterior corners of the head. Mandibles narrow, with oblique apical borders armed with six teeth, the first, second and fourth of which from the tip are large, the others minute. Frontal carinae short, parallel, farther apart than their distance from the sides of the head. Clypeus convex and rounded in the middle, its anterior border straight and entire. Frontal area and groove absent. Antennal scapes not reaching to the posterior corners of the head by

a distance equal to their greatest diameter; first funicular joint nearly one and one-half times as long as broad, second small and short, broader than long, remaining joints, except the last, all broader than long but gradually increasing distally in length and thickness. Thorax small, feebly but distinctly impressed at the mesoëpinothoracic suture, otherwise slightly convex in dorsal outline; base of epinotum straight, forming a distinct obtuse angle with the declivity which is decidedly longer. Seen from above the pronotum is nearly twice as broad as long, the mesonotum is subcircular and about as long as broad, the epinotum longer than broad and laterally compressed. Petiole very small and flat, elliptical, its node represented by a low semicircular swelling at the anterior end, and completely concealed under the large first segment of the elliptical gaster. Legs of the usual shape.

Shining, very finely and indistinctly punctulate.

Hairs and pubescence pale yellow, the former very sparse, distinct only on the mandibles, clypeus and gaster; the pubescence fine and rather dense, slightly obscuring the shining surface, rather long and oblique on the scapes.

Pale brownish yellow; legs scarcely paler; mandibular teeth reddish.

*Female* (depleted). Length 1.8 mm.

Head much as in the worker, but the posterior corners less rounded and the posterior border feebly sinuate in the middle, the eyes larger and more convex, only about half their length from the anterior corners of the clypeus. Scapes shorter, extending to about two-thirds the distance between the eyes and the posterior corners of the head. Thorax slightly narrower than the head, elongate subelliptical, depressed above; pronotum very short and transverse; mesonotum as long as broad, rounded anteriorly; epinotum short, with very short base passing gradually into the long sloping declivity. Petiole as in the worker. Gaster more than three times as long as broad, parallel-sided, first segment covering the petiole and provided with a very distinct impression for its accommodation.

Subopaque and more densely punctulate than the worker; pilosity and pubescence very similar; head and thorax pale yellowish brown, gaster dark brown; mandibles, antennæ, legs and broad margins of the gastric segments brownish yellow.

*Male*. Length about .8 mm.

Head subrectangular, longer than broad, somewhat narrowed behind. Eyes flattened, as long as about half the length of its sides. Mandibles rather well-developed, overlapping, with very minutely denticulate apical borders. Clypeus with straight, entire anterior

border. Antennal scapes reaching to the posterior corners of the head; basal funicular joints slightly, terminal joints considerably longer than broad. Thorax as broad as the head. Petiole very much as in the worker. Gaster short.

Sculpture and pilosity as in the worker. Color pale sordid yellow. Wings grayish, pubescent, rather opaque, with pale brownish veins.

Specimens from a single colony which I found nesting in a cauline swelling of *Cordia alliodora* on Barro Colorado Island, Panama. This very small species is evidently quite distinct from *ramulorum*, *atricaps* Emery, *heyeri* Forel and *littorale* Wheeler.

#### TAPINOMA FULVUM sp. nov.

*Worker.* Length 3-3.3 mm.

Head nearly as broad as long, broader behind than in front, with distinctly and broadly concave posterior border; sides convex behind; cheeks straight or slightly concave. Eyes moderately large, convex, shorter than their distance from the corners of the clypeus, which is large and broad, somewhat flattened in the middle, its anterior border with a feebly sinuate but not projecting median area, separated on each side by a minute notch from the straight antero-lateral border. Frontal carinae well-developed, farther apart than their distance from the lateral borders, arcuate and posteriorly diverging outward towards the middle of the eyes. Frontal area obsolete. Antennae long and rather slender; scapes reaching nearly one-fourth their length beyond the posterior border of the head; funiculi thickened as usual towards the tip; first joint fully three times as long as broad; joints 2-10 subequal, nearly one and one-half times as long as broad, terminal joint rather acutely pointed, as long as the two preceding joints together. Mandibles stout and convex, decussating when closed, their terminal borders broad, with 5 or 6 larger apical teeth and 6 or 7 basal denticles. Thorax stout but much narrower than the head; pronotum broader than long, convex dorsally and laterally; mesonotum nearly one and one-half times as long as broad, rounded and convex in front where it rises distinctly above the pronotum, concave behind and descending to the unusually deep mesoepinotal impression with its prominent spiracles; epinotum longer than broad, also with prominent spiracles; its base convex and rising obliquely and abruptly upward and backward from the impression and curving into the straight, sloping declivity, which is fully twice as long as the base. Petiole regularly elliptical, flat above, with thickened anterior border representing the vestigial

node, ventral surface convex. Gaster large, with pointed tip, its anterior segment overlying and concealing the petiole and with a concave area for its reception. Legs moderately long.

Opaque throughout, very finely, densely and indistinctly punctulate and irregularly shagreened; mandibles also with sparse, coarser punctures.

Hairs on mandibles rather long, white and subappressed, on pronotum and gaster somewhat brownish, long, sparse and erect, arising from minute dark brown dot-like insertions, shorter on the epinotum. Pubescence glistening white, short, subappressed, most distinct on the cheeks, vertex, epinotum, gaster and appendages but not concealing the surface.

Rich fulvous yellow; petiole, gaster and legs paler yellow, the gaster with an anteriorly ill-defined pale brown band near the posterior border of each segment; mandibular teeth deep reddish brown.

Described from numerous specimens taken from under a flat carton shed on the trunk of a sapling in company with coccids, on Barro Colorado Island, Panama, June 21, 1924.

*TAPINOMA FULVUM SUBLUCIDUM* subsp. nov.

*Worker.* Differing from the preceding form in having the head slightly narrower, with less convex sides and the anterior portion of the mesonotum somewhat less projecting above the posterior portion of the pronotum. The sculpture, too, is different, the surface of the mandibles, body and appendages, being distinctly smoother and somewhat shining or lustrous, owing to the more superficial punctulation. Color as in the typical *fulvum* but the thorax is somewhat paler than the head, which is often brownish posteriorly and the tips of the scapes on their inner surfaces and the femora towards their tips are faintly tinged with brown. The pale brown bands on the gaster are also somewhat more distinct.

Numerous specimens from two colonies on Barro Colorado Island (July 1924). These were also in flat carton sheds with coccids on the bark of living trees.

*TAPINOMA AMAZONÆ* sp. nov.

*Worker.* Length 2.5-3 mm.

Head slightly longer than broad, somewhat broader behind than in front, with moderately, evenly convex sides and straight, transverse

border. Eyes rather large and convex, as long as their distance from the anterior corners of the head. Clypeus convex in the middle, its anterior border rounded and entire in the middle and slightly sinuate on each side; its posterior suture rather indistinct. Frontal area and groove absent; frontal carinae short, subparallel, slightly farther apart than their distance from the lateral borders of the head. Mandibles stout, convex, their oblique terminal borders with about 10 or 11 teeth, the first, second and fourth from the tip large, the others minute, subequal denticles. Antennae rather stout, scapes extending nearly one fourth their length beyond the posterior border of the head; funicular joints 2-4 one and one-half times as long as broad, joints 5-10 shorter but distinctly longer than broad, last joint as long as the two preceding joints together. Thorax rather short, its dorsal outline in profile straight and horizontal in the middle; promesonotal suture impressed; mesoepinotal impression deeper and acute; seen from above the pronotum is short, one and one-half times as broad as long, with convex humeri, mesonotum somewhat longer than broad, not rising above the pronotum; base of the latter convex, very short, not more than a fourth as long as the straight, flat, sloping declivity, which from behind is semicircularly rounded above with straight ventrally diverging sides. Petiole elliptical, narrow, twice as long as broad, flattened above, with only a vestige of a node at its anterior end. Gaster large, not pointed posteriorly. first segment overlying and concealing the petiole. Legs moderately long.

Shining and very finely and evenly punctulate or reticulate; mandibles smoother, sparsely and coarsely punctate.

Hairs and pubescence yellowish; the former present only on the mandibles and clypeus, the latter short but dilute on the body, most distinct on the gaster, thorax and sides of head but not concealing the surface, shorter on the appendages, dense on the tibiae.

Brown, head darker and more blackish, especially behind; mandibles, mouthparts, sides of clypeus, antennae and legs, including the coxae, brownish yellow.

Described from a number of workers taken many years ago by Prof. C. F. Baker at Pará, Brazil.

This species is quite distinct from *T. atriceps* Mayr in size, shape of head, coloration, etc., and is much more like our common North American *T. sessile* Say, but the head is shorter and the shape of the thorax and the coloration are quite different.

## Subfamily FORMICINÆ

## MYRMELACHISTA Roger

Emery, in the *Genera Insectorum* (1921), has associated this genus, founded by Roger seventy years ago, with the Australian *Stigmatopoda* in his tribe Myrmelachistini among the Alloformicinae, the most primitive section of the great subfamily Formicinae. Ethologically, at least, this association appears to be rather artificial, because the species of *Myrmelachista* are all exquisitely arboreal, nesting in tenuous galleries in dead twigs or in the cavities of myrmecophytes or epiphytes, whereas the species of *Stigmatopoda* live in rather dry soil under stones or very rarely under bark, and therefore behave more like the species of *Acantholepis*, which Forel regarded as their closest allies. In 1886 Forel divided *Myrmelachista* into two subgenera, namely *Myrmelachista sens. str.* (worker and female with 9-jointed, male with 10-jointed antennae) and *Decamera* Roger (worker and female with 10-jointed, male with 11-jointed antennae). Until 1927, when Menozzi described a species (*plebecula*) of *Myrmelachista sens. str.* from Costa Rica, this subdivision of the genus seemed also to have a geographical basis, since *Myrmelachista sens. str.*, which includes the genotype (*kraatzii* Roger), was supposed to be confined to the West Indies, the subgenus *Decamera* to the continental portion of the Neotropical Region. Dr. Skwarra has now discovered several forms of *Myrmelachista sens. str.* in Mexico, and I am adding others which have long been standing in my collection, from Porto Rico, Costa Rica, British Guiana and northern Brazil. It still remains true, however, that the species of this subgenus inhabit countries around the Caribbean sea and the Gulf of Mexico, while the *Decamera* species are for the most part confined to South America and especially to Brazil, Chili and Argentina.

The species of *Myrmelachista sens. str.* are poorer in plastic characters than those of *Decamera*. Moreover, the workers seem to be distinctly though feebly polymorphic, since the larger individuals have the head proportionally larger and broader and the border of the petiolar scale more deeply sinuate or excised. The male genitalia appear to furnish more valuable characters, but unfortunately the males of only three of the species of *Myrmelachista sens. str.* are known (see Figs. 1-3). I insert a key which may aid in the identification of the workers of this subgenus.

1. Antennal scapes with erect or suberect hairs . . . . . 2  
    Antennal scapes without such hairs . . . . . 11
2. Hairs on scapes conspicuously long and confined to their anterior  
    surfaces . . . . . 3  
    Hairs on scapes shorter, more generally distributed . . . . . 5
3. Petiolar border distinctly excised; head red, clouded with brown  
    only on the occiput. Length 2.3 mm. St. Vincent. *ambigua* Forel  
    Petiolar border entire or feebly sinuate; head largely black or  
    dark brown . . . . . 4
4. Length 1.75-2.3 mm. Second funicular joint broader than long.  
    Virgin Islands, Porto Rico, Santo Domingo. *ramulorum* Wheeler  
    Length 2.3-2.6 mm. Larger and stouter; second funicular joint  
    longer than broad. Mona Island and Porto Rico . . . . .  
    . . . . . var. *fortior* var. nov.
5. Antennal clubs not infuscated . . . . . 6  
    Antennal clubs more or less infuscated . . . . . 8
6. Thorax and gaster black . . . . . 7  
    Thorax and gaster castaneous. Length 1.5-2.5 mm. Cuba . . . . .  
    . . . . . *rogeri* Ern. André
7. Head largely red; petiolar border deeply excised. Length 1.75-  
    2.5 mm. Cuba . . . . . var. *rubriceps* Mann  
    Only the anterior border of head red; petiolar border feebly ex-  
    cised. Cuba . . . . . var. *manni* var. nov.
8. Sides of head rather convex; base of epinotum longer than the  
    declivity. Length 2.3-2.5 mm. Costa Rica . . . . .  
    . . . . . *costaricensis* var. nov.  
    Sides of head straight; base and declivity of epinotum subequal . 9
9. Larger forms (2-2.5 mm.); head, thorax and antennal clubs black.  
    Mexico . . . . . *skwarrae* sp. nov.  
    Smaller forms (1.5-1.75 mm.) head and thorax not black; antennal  
    clubs fuscous . . . . . 10
10. Head small; head, thorax and petiole piceous brown. Mexico . . . .  
    . . . . . var. *picea* var. nov.  
    Head larger; head, thorax and petiole yellowish red. Mexico . . . .  
    . . . . . var. *laeta* var. nov.
11. Fore tarsi enlarged; petiolar scale oval; color reddish yellow, with  
    dark brown gaster and pale yellow antennæ and tibiae. Length  
    2 mm. Cuba . . . . . *kraatzii* Roger  
    Fore tarsi not enlarged; petiolar scale not oval . . . . . 12
12. Head red . . . . . 13  
    Head castaneous or black . . . . . 14



13. Petiolar scale broader than high, with convex sides, broadest in the middle; erect hairs absent on thorax; gaster brown. Length 2 mm. Costa Rica.....*plebecula* Menozzi  
Much smaller (1.2 mm.); petiolar scale narrow, with nearly straight sides, broadest above; erect hairs present on thorax; gaster black. Brazil.....*brevicotnis* sp. nov.
14. Pronotum yellow or reddish yellow, contrasting with remainder of thorax. Length 1.5-1.75 mm. Mexico.....*amicta* sp. nov.  
Pronotum piceous, black, castaneous or brownish red, concolorous with remainder of thorax. Length 1.3-2 mm. British Guiana...  
.....*guyanensis* sp. nov.

#### MYRMELACHISTA RAMULORUM Wheeler

This form, of which I described (1908) all three castes from Culebra Island and Porto Rico, and which has since been recorded by Mann from St. Thomas and by Menozzi from Santo Domingo, I now regard as an independent species and not as a subspecies of *ambigua* Forel. Judging from Forel's description which was drawn from a single specimen of this species from the Island of St. Vincent, the worker of *ramulorum* is more slender, with longer and deeper mesoepinotal constriction and more deeply emarginate petiolar scale. The antennal scapes reach nearly halfway between the eyes and the posterior corners of the head. The clypeal border bears a minute denticle in the middle. In the male the second funicular joint is distinctly longer than broad and joints 3-5 are very nearly as long as broad. The mandibles are bidentate, with the basal tooth distinctly angular. The genitalia (Fig. 1) resemble those of *skwarrae* sp. nov. described below.

#### MYRMELACHISTA RAMULORUM FORTIOR subsp. nov.

*Worker.* Length 2.3-2.6 mm.

Differing from the typical form in being decidedly larger and more robust; head larger and broader; joints 2-5 of the funiculi decidedly longer, the second distinctly longer than broad, the third and fourth as long as broad. Petiolar scale as in the typical form, with entire or very feebly and broadly sinuate superior border. In profile this border is decidedly thicker and blunter; the posterior pedunculate extension of the petiole well-developed as in the typical form.

Erect hairs on the body, scapes and tibiae even more numerous and longer. Coloration more vivid, the mandibles and head being deep red,

the latter blackish behind, the thorax and appendages of a more reddish yellow tint than in the typical *ramulorum*.

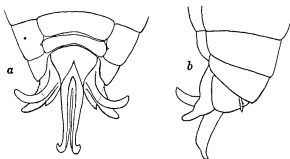


Fig. 1. Genitalia of male *Myrmelachista ramulorum* Wheeler; a, ventral, b, lateral aspect.

Described from nine specimens taken by Dr. F. E. Lutz, seven from Mona Island (type-locality) and two from Porto Rico, without more precise locality.

#### MYRMELACHISTA ROGERI Ernest André

Dr. Mann describes the worker of the typical form of this species from Saetia (Oriente), Cuba as "black with the anterior margin of the head and mandibles reddish and the antennæ and tarsi brown," whereas André gives the coloration as "deep castaneous, almost black; mandibles and anterior portion of the head more reddish; antennæ, articulations of the legs and tarsi sordid yellow." Dr. W.S. Creighton has recently sent a number of specimens from the vicinity of Cienfuegos, Cuba, which seem to approach the typical form as described by André more closely than Mann's specimens. I therefore regard the latter as representing a distinct variety, which may be called *manni* var. nov. The following is a description of the worker and female from Creighton's specimens:

*Worker.* Length 1.5-2.5 mm.

Head subrectangular, only slightly longer than broad, slightly narrower in front than behind, with nearly straight, subparallel sides and straight or feebly concave posterior border. Mandibles stout and convex. Eyes small, flat, at the middle of the sides of the head. Cly-

peus convex, almost subcarinate in the middle, its anterior border with a distinct median denticle. Frontal area and groove indistinct. Antennæ short; scapes distinctly flattened, their tips reaching to the posterior third of the sides of the head; club stout, as long as the remainder of the funiculus; joints 2-5 small, broader than long, the two basal joints of the club nearly as long as broad, together somewhat shorter than the swollen terminal joint. Promesonotum convex, hemispherical; mesoepinotal impression pronounced; epinotum rather low, with straight and subequal base and declivity, meeting at a distinct obtuse angle. Petiolar scale small, subquadrate from behind, with more or less distinctly excised superior border; in profile short, cuneate, strongly compressed and acute above.

Very smooth and shining, with sparse piligerous punctures; mandibles longitudinally punctate-striate.

Hairs yellowish, sparse, suberect, partially subappressed on the head; rather numerous and suberect on the scapes, both on the anterior and posterior surfaces. Pubescence absent.

Castaneous brown; mandibles and more or less of the anterior portion of the head paler and more reddish; posterior borders of gastric segments, antennæ, tarsi, knees and in some specimens also the tibiae brownish yellow.

*Female* (undescribed; dealated). Length 3.2-4.3 mm.

Head longer and more sharply rectangular than in the worker, fully one and one-fourth times as long as broad, with straight parallel sides and straight posterior border. Mandibles 5-toothed, the median and basal tooth minute. Thorax elongate, distinctly depressed; mesonotum longer than broad; epinotum low, without an angle between the long, straight, horizontal base and the short, rounded declivity. Petiole thicker than in the worker, with blunt, straight and transverse superior border:

Mandibles and clypeus coarsely punctate, the latter finely striate on the sides; sculpture of the other parts and the pilosity as in the worker.

Color decidedly paler, reddish; the mesonotum, scutellum, legs and antennæ brownish yellow.

Described from sixteen workers and five females taken by Dr. W. S. Creighton at San Blas, near Cienfuegos, Cuba. Mann's var. *rubriceps* from Pinares, Cuba differs from the above in its more deeply excised petiolar scale and in color, being black, with brownish red head, mandibles and antennæ and brown tarsi.

## MYRMELACHISTA SKWARRÆ sp. nov.

*Worker.* Length 2-2.5 mm.

Head large, rectangular, as broad as long, slightly narrower in front than behind, with straight sides and posterior border, flattened dorsally and ventrally. Eyes small, flat, near the middle of the sides of the head. Mandibles convex, 5-toothed, the median tooth small. Clypeus convex, its anterior border with a minute, acute, median denticle. Frontal carinae short, subparallel, somewhat farther apart than their distance from the lateral borders of the head. Antennae rather stout; scapes extending a distance equal to their greatest diameter beyond the posterior orbits; first funicular joint large, fully twice as long as broad; joints 2-5 small, the second nearly as long as broad, 3-5 much shorter; club stout, its two basal joints as long as broad, together shorter than the swollen terminal joint. Thorax short and stout though considerably narrower than the head; promesonotum convex, subhemispherical; mesonotum transversely rounded-rectangular, one and one-half times as broad as long; mesoëpinothal constriction short and shallow dorsally, pronounced laterally; epinotum lower and shorter than the promesonotum, somewhat longer than wide, narrowed anteriorly, with rounded sides; base and declivity subequal in profile, the former feebly convex, the latter sloping and somewhat concave posteriorly. Petiole rather short, as high as long; scale scarcely inclined forward, narrow, with rather thin, acute, very feebly sinuate superior border. Gaster large, oval; first segment rounded anteriorly, the tip pointed. Legs rather stout, fore femora distinctly enlarged.

Smooth and shining, with sparse piligerous punctures. Mandibles obscurely punctate-striate; clypeus, anterior borders of cheeks and neck reticulate.

Hairs glistening white, bristly, moderately long on the head, thorax and gaster, partly erect and partly shorter and appressed. Scapes and funiculi with numerous erect or suberect hairs, legs with short, sparse suberect hairs.

Black; neck, tips of coxae, trochanters, bases and tips of femora, tibiae, scapes and basal joints of funiculi brownish yellow or yellowish brown; mandibles, mouthparts and anterior borders of cheeks reddish brown.

*Female.* Length 3-4 mm.

Slender; head rectangular, one and one-third times as long as broad, flattened above and below, with rounded posterior corners, straight

subparallel sides and feebly sinuate posterior border. Mandibles large and convex, with strong teeth. Clypeus convex, its anterior border with a small median tooth. Eyes rather small, flat, a little in front of the middle of the sides of the head; ocelli small, widely separated. Antennae as in the worker, but scapes reaching only to the posterior orbits. Thorax elongate oval, about two and one-third times as long as broad, broader than the head; mesonotum very flat above, decidedly longer than broad; epinotum small and short, feebly rounded in profile, without distinct base and declivity. Petiole broader than in the worker, scale more inclined forward, with the superior border transverse, straight and entire or feebly sinuate in the middle. Gaster large, elongate-elliptical, fully as long as the remainder of the body. Legs rather stout, with somewhat enlarged femora. Wings long, measuring 4 mm., with well-developed venation; marginal cell closed; discoidal cell absent.

Sculpture, pilosity and color as in the worker, but mandibles and cheeks more distinctly punctate-rugulose. Wing-membranes faintly brownish; veins and pterostigma pale brown.

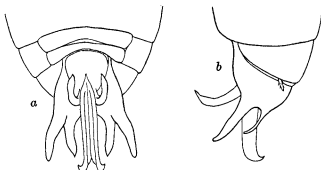


Fig. 2. Genitalia of male *Myrmelachista skwarrae* sp. nov.; a, ventral, b, lateral aspect.

*Male.* Length 2.5–2.7 mm.

Head through the eyes broader than long, convex and semicircularly rounded behind, with short, slightly convex, anteriorly converging cheeks. Eyes large and prominent; ocelli moderately large. Mandibles narrow, geniculate at the base, bidentate apically, the terminal tooth small and acute, the basal tooth in the form of a rounded lobe. Clypeus very convex, its anterior border rounded, without distinct median

denticle. Antennæ 10-jointed; scapes fully six times as long as broad; first funicular joint large, twice as long as broad; joints 2-5 small, the second as long as broad; 3-5 broader than long, the three basal joints of the club not longer than broad, subequal, together longer than the somewhat broader terminal joint. Thorax robust, much broader than the head, oval, less than twice as long as broad; mesonotum as broad as long, dorsally flattened, anteriorly convex and projecting above the very short pronotum; epinotum small, shaped like that of the female. Petiolar scale like that of the worker but inclined more forward, its superior border thicker, when seen from behind straight, transverse and entire. Gaster elliptical; genitalia very large and exerted (Fig. 2). Legs slender. Wings broad.

Sculpture, pilosity and color as in the worker and female, but the pilosity less conspicuous and the body more piceous black; antennal clubs less infuscated; mandibles subopaque, densely punctate. Wings slightly paler than in the female, but their veins and pterostigma of the same color.

Described from numerous workers, seven females and six males (762) taken by Dr. Skwarra at Cuautla, Morelos (type-locality) in *Tillandsia circinata*, a number of workers belonging to several colonies (770, 771, 772, 777, 783a and 786) taken at Cuernavaca, Morelos in the same plant, and several workers (Z 208a) at Mirador, Vera Cruz in *T. Valenzuelana*.

MYRMELACHISTA SKWARRE PICEA subsp. nov.

*Worker.* Length 1.5-1.75 mm.

Differing from the typical form in its distinctly smaller size, its relatively smaller head and in having the head, thorax and petiole piceous brown, with darker brown gaster and the borders of its segments yellowish.

Mandibles, cheeks and clypeus reddish; antennæ and legs paler, brownish yellow, with the clubs of the former either slightly or not at all infuscated and the infuscation of the legs confined to the femora. Petiolar scale more compressed above, with more acute and somewhat more deeply sinuate superior border. Hairs on the body shorter and sparser, more appressed on the legs, but distinct and suberect on the antennal scapes and funiculi.

Several workers taken by Dr. Skwarra at Cuernavaca, Morelos (772, 773, 774 and 787) nesting in *Tillandsia circinata*.

*MYRMELACHISTA SKWARRE LETA* subsp. nov.

*Worker.* Length 1.5–1.75 mm.

Not larger than the preceding species but with the head broader and shaped as in the typical *skwarra*, though somewhat less sharply rectangular, the sides being slightly more convex and the posterior border distinctly sinuate. Petiolar scale from behind more rectangular, with compressed, acute, straight or feebly sinuate superior border. Sculpture and pilosity as in the typical *skwarra*. Head, thorax and petiole rather bright yellowish red; gaster dark brown, with the posterior borders of the segments yellowish; head darker red posteriorly; appendages yellow; clubs of antennae darker red, not infuscated; femora sometimes faintly infuscated in the middle.

Described from five workers (40) taken by Dr. Skwarra at Mirador Vera Cruz (type locality) in *Tillandsia Balbisiana*, and one worker (762) taken at Cuautla, Morelos in *T. circinata*.

*MYRMELACHISTA AMICTA* sp. nov.

*Worker.* Length 1.5–1.75 mm.

Head moderately large, subrectangular, as broad as long, with straight posterior border and nearly straight sides. Eyes flat, near the middle of the sides. Mandibles broad, very convex, 5-toothed, the median tooth very small. Clypeus convex, its anterior border with a minute median denticle. Antennae 9-jointed; rather short; scapes extending slightly beyond the posterior orbits; first joint rather narrow, fully twice as long as broad; joints 2–5 small; second joint nearly as long as broad; 3–5 much shorter; two basal joints of the large club distinctly longer than broad, together shorter than the swollen terminal joint. Thorax short but narrower than in *skwarra*, with more pronounced mesoepinotal constriction; promesonotum convex, subhemispherical, considerably larger than the epinotum; mesonotum subelliptical, less than one and one-half times as broad as long; epinotum lower than the promesonotum, not longer than broad, subcuboidal, with subequal base and declivity, meeting at a distinct angle, the declivity less sloping than in *skwarra*. Petiole short, its scale only slightly inclined forward, decidedly thinner than in *skwarra*, subrectangular from behind, with sharp, distinctly emarginate superior border. Gaster ovoidal, its first segment rounded anteriorly, its tip rather long and pointed. Legs rather slender, fore femora somewhat enlarged.

Smooth and shining, with fine, very sparse, piligerous punctures on the body; mandibles and clypeus superficially reticulate-punctate.

Hairs glistening white, much sparser and shorter than in *skwarra*, numerous but appressed on the scapes and legs, more suberect on the funiculi.

Deep castaneous; mandibles, anterior portion of head and upper surface of pronotum red or yellowish red; femora dark brown except at their bases and tips, which, like the tibiae, tarsi and antennae are yellow; last joint of antennal clubs feebly infuscated.

Described from 16 workers (618) taken by Dr. Skwarra at Mirador, Vera Cruz in *Tillandsia Balbisiana* and three (296) from the hollow stem of a composite.

*MYRMELACHISTA COSTARICENSIS* sp. nov.

*Worker.* Length 2.3–2.5 mm.

Head moderately large, subrectangular, very slightly longer than broad and slightly narrower in front than behind, with feebly concave posterior border. Eyes rather small, flat, near the middle of the sides. Mandibles convex, 5-toothed, the second, third and fifth tooth very small. Clypeus convex, its anterior border somewhat angularly produced, with a small acute median denticle. Antennae short; scapes slender, reaching a distance equal to their greatest diameter beyond the posterior orbits; second funicular joint nearly as long as broad; joints 3–5 subequal, decidedly broader than long; club moderately large, much longer than the remainder of the funiculus, the two basal joints as broad as long, together distinctly shorter than the more swollen terminal joint. Thorax rather slender, with deep lateral and shallower dorsal mesoepinotal constriction. Pro- and mesonotum subspherical, broader, but very slightly longer than the epinotum, which is longer than broad and distinctly narrowed anteriorly; mesonotum transversely rounded-rectangular, less than twice as broad as long. In profile the promesonotum is higher and more convex than the epinotum, which has a feebly convex base and a decidedly shorter sloping, concave declivity. Petiole short, without posterior peduncle, its scale cuneiform in profile, slightly inclined forward, broadest above, with nearly straight, ventrally converging sides, its summit acute, in large specimens distinctly, in small ones feebly excised. Gaster large, oval; anterior border of first segment rounded, the tip pointed. Legs short, fore and hind femora somewhat thickened.



Smooth and shining, with very fine, sparse, piligerous punctures; mandibles indistinctly punctate-striate.

Hairs pale yellowish, rather coarse and bristly, erect, sparse and rather long on the head, thorax and abdomen; head also with shorter, sparse appressed hairs on the dorsal surface; scapes, funiculi and legs with numerous short, erect or suberect hairs.

Head red, thorax yellow above, with brown or blackish pleuræ; gaster dark brown, with the posterior borders of the segments yellowish; palpi, antennæ and legs paler yellow; antennal clubs and femora distinctly infuscated.

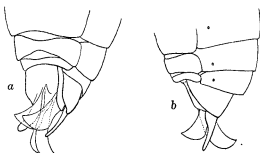


Fig. 3. Genitalia of male *Myrmelachista costaricensis* sp. nov.; a, ventrolateral, b, lateral aspect.

*Male.* Length 1.8-2.3 mm.

Head through the eyes somewhat broader than long, semicircularly rounded behind, with short, straight, anteriorly converging cheeks. Eyes and ocelli large and prominent. Clypeus like that of the worker, but with only an indistinct trace of the median denticle. Mandibles narrow, somewhat broadened apically, bidentate, the apical tooth acute, the basal short and blunt. Antennæ 10-jointed; scapes fully 5 times as long as broad; first funicular joint nearly twice as long as broad; joints 2-5 small, nearly as long as broad; club very distinctly 4-jointed, the 3 basal joints subequal, longer than broad, together much longer than the somewhat more swollen terminal joint. Thorax large, broader than the head; mesonotum large, subcircular, as broad as long, very convex in front, flattened behind. Epinotum small, lower than the mesonotum, shaped somewhat as in the worker. Petiolar scale lower and thicker, its summit much less acute, from behind straight, transverse and entire. Gaster shaped as in the worker; genitalia large and exerted (Fig. 3). Legs long and slender.

Wings longer than the body, with well-developed pterostigma and closed marginal cell; discoidal cell lacking.

Smooth and shining; mandibles subopaque, finely and densely punctate.

Pilosity pale, shorter and less abundant than in the worker.

Head deep castaneous, clypeus, mandibles, and scapes somewhat paler; funiculi, thorax, petiole, venter, legs and genitalia brownish yellow; femora and tibiae somewhat darker; dorsum of gaster brown, paler than the head; wings colorless, with very pale yellow veins and pterostigma.

Described from 16 workers and 12 males which I found living in a species of *Tillandsia* at Alajuela, Costa Rica, Nov. 28, 1911.

This species is closely related to Menozzi's *plebecula* from Costa Rica, but the latter is described as having shorter antennal scapes, the second funicular joint is longer than broad, the petiolar scale of a different shape, being broader than high, with rounded sides. Apparently, also, *plebecula* is less pilose and the pleuræ are not black or dark brown.

MYRMELACHISTA GUYANENSIS sp. nov.

*Worker.* Length 1.3-2 mm.

Head subrectangular, rather flat, slightly longer than broad and slightly narrower in front than behind, with feebly concave posterior and feebly convex lateral borders. Eyes small, flat, slightly in front of the middle of the sides. Mandibles stout, convex, 5-toothed, the median tooth minute. Clypeus convex in the middle, its anterior border sinuate on each side, rounded, projecting and crenulate in the middle and sometimes bearing two closely approximated denticles in the position of the single denticle of other species. Frontal area rather distinct, flat and triangular. Antennæ short; scapes curved and somewhat flattened at the base, extending about twice their greatest diameter beyond the posterior orbits; joints 2-5 of the funiculus subequal, strongly transverse, two basal joints of club subequal, together somewhat shorter than the terminal joint. Thorax of the usual shape but rather depressed above; mesoëpinotal constriction short and rather feeble in profile, deep on the sides; metaëpinotal suture distinct but the metanotal spiracles not projecting; base of epinotum flattened, straight in profile, longer than the very sloping declivity. Petiole with distinct posterior peduncle; scale slightly inclined forward, narrow below, widening above, with slightly convex sides and feebly but

distinctly excised, though blunt superior border, so that in profile it is nearly as thick above as below.

Very smooth and shining, minutely and sparsely punctate; mandibles finely punctate-reticulate at the tips; metanotum more opaque, reticulate-rugulose.

Erect hairs and pubescence pale, whitish; the former very scarce, confined to the clypeus and posterior borders of the gastric segments; the latter sparse, appressed, moderately long on the head, thorax and gaster, very short and dilute on the legs and antennae.

Castaneous brown; thorax alone or both head and thorax sometimes paler and more reddish brown; cheeks and clypeus yellowish brown; mandibles, antennae, tibiae, articulations of legs, sutures of thorax and posterior borders of gastric segments brownish yellow; mandibular teeth black; antennal clubs slightly darker than the bases of the funiculi but not infuscated.

*Female.* Length 3-3.3 mm.

Head like that of the worker in being distinctly narrower anteriorly, but suboblong, one and one-fourth times as long as broad, with straight sides and posterior border. Eyes larger, flat, placed more anteriorly; ocelli small, widely separated. Anterior clypeal border broader, less projecting and more nearly straight, crenulate or with two minute, closely approximated median denticles. Thorax broader than the head, twice as long as broad, much flattened, especially in the region of the mesonotum, which is large, subhexagonal, as broad as long; epinotum low, its dorsal surface very feebly convex, sloping, without distinct base and declivity. Petiolar scale thicker, stouter, with entire, much more obtuse superior border than in the worker. Gaster elongate-elliptical, as long as the remainder of the body. Wings long, with one long cubital cell and no discoidal cell.

Sculpture, pilosity and color as in the worker, but the mesonotum and scutellum pale brown or brownish yellow. Wings colorless, with pale yellow veins and pterostigma.

Described from numerous workers and five females which I took at Kartabo, British Guiana, inhabiting tenuous, anastomosing galleries in dead twigs and branches.

*MYRMELACHISTA BREVICORNIS* sp. nov.

*Worker.* Length 1.2 mm.

Resembling *guianensis* in the shape of the head, but the mandibles are smaller, much less convex, with smaller and more nearly subequal

teeth and distinctly shorter antennæ. The scapes scarcely extend beyond the posterior orbits of the small, flat eyes; joints 2-5 of the funiculi even shorter than in *guyanensis* and the two basal joints of the clubs broader than long and together much shorter than the large, swollen terminal joint. Thorax like that of *guyanensis* but the mesonotum less depressed, more distinctly elevated above the epinotum; the petiolar scale narrower, with straight subparallel sides and only feebly sinuate superior border; posterior peduncle scarcely developed.

Sculpture and pilosity as in *guyanensis* but there are a few short, erect hairs on the thorax and the pubescence on the tibiæ and scapes is longer and somewhat oblique.

Head, thorax and petiole rather bright yellowish-red; gaster black; antennæ and legs reddish-yellow; mandibular teeth reddish.

Two specimens from Santarem, Brazil, received many years ago from Staudinger and Bang-Haas. These specimens had passed through Emery's hands but he had refrained from describing them.

MYRMELACHISTA (DECAMERA) MEXICANA sp. nov.

*Worker.* Length 1.5-2 mm.

Head small, convex above and behind, rounded subrectangular, distinctly longer than broad, scarcely broader behind than in front, with rather convex sides and straight posterior borders. Eyes flat, at the middle of the sides. Clypeus moderately convex, almost subcarinate, its rounded anterior border with a small, acute median tooth. Frontal carinæ short, straight, parallel, nearly as far apart as their distance from the lateral borders of the head. Mandibles convex, 5-toothed. Scapes of the 10-jointed antennæ reaching half way between the posterior orbits and the rounded posterior corners of the head; first funicular joint fully twice as long as broad; joints 2-6 small, the second as long as broad, 3-6 slightly broader than long; club large, its two basal joints subequal, longer than broad, together nearly as long as the decidedly more swollen terminal joint. Thorax slender, narrower than the head, hour-glass shaped, with the mesoepinotal constriction deep both dorsally and laterally; promesonotum oval, broader and somewhat larger than the epinotum; mesonotum as long as broad, broader in front than behind; metaepinotal suture distinct, metanotal spiracles large and prominent, epinotum in profile evenly rounded, without differentiated base and declivity, somewhat lower than the promesonotum, the posterior portion of the declivity slightly concave. Petiole small, narrow, much longer than high, with long

posterior peduncle; scale thick, strongly inclined forward, the very blunt summit of the scale strongly rounded and entire when seen from behind. Gaster small, elliptical, with pointed tip. Legs slender, only the fore femora slightly enlarged.

Smooth and shining, with small, sparse, piligerous punctures; mandibles punctate-striate; clypeus obscurely striate; upper surface of epinotum reticulate.

Pilosity glistening white, sparse, bristly, erect or suberect on the body; shorter and more abundant on the appendages, erect on the scapes, conspicuous on the funiculi, more oblique on the legs.

Deep castaneous; mandibles and clypeus reddish; pronotum, trochanters and tarsi paler, more yellowish brown.

*Female* (deallated). Length nearly 4 mm.

Long and slender. Head strongly rectangular, one and one-third times as long as broad, convex above, slightly broader behind than in front, with straight sides and posterior border. Eyes rather large, nearly flat, in front of the middle of the sides; ocelli small, widely separated. Mandibles very convex, with stout teeth. Clypeus convex, with a stout, blunt upturned tooth at the middle of its anterior border. Thorax from above elliptical, nearly two and one-half times as long as broad, somewhat broader than the head; mesonotum flat, subcircular, as long as broad; epinotum small, sloping, scarcely convex in profile, without distinct base and declivity. Petiole as in the worker, but the node with more broadly rounded superior border. Gaster large, elongate elliptical.

Sculpture, pilosity and color as in the worker, except that the mandibles are red and the thorax is deep castaneous throughout.

*Male*. Length 1.5-2 mm.

Head through the eyes distinctly broader than long, convex and subcircular behind, cheeks short, straight and converging anteriorly. Mandibles narrow, edentate, pointed at their tips and strongly geniculate at their bases. Eyes large; ocelli very small and widely separated. Clypeus short, its anterior border with a very minute median denticle. Antennæ 11-jointed, slender; scapes about eight times as long as broad; first funicular joint somewhat swollen, pyriform, nearly twice as long as broad; second joint as long as broad; joints 3-6 slightly broader than long; 8-9 as broad as long, together as long as the last joint of the rather indistinct 4-jointed club. Thorax long, broader than the head; pronotum small; mesonotum elliptical, longer than broad, flattened posteriorly, very convex anteriorly; epinotum small and sloping as in the female; mesosterna long but flattened. Petiole

short, without posterior peduncle; scale low, thick, nodiform, with rounded summit. Gaster elliptical; genitalia small but exerted (Fig. 4). Legs slender. Fore wings broad, with well developed pterostigma and closed marginal cell; cubital and discoidal veins imperfect, discoidal cell absent.



Fig. 4. Genitalia of male *Myrmelachista* (*Decamera*) *mexicana* sp. nov.; a, dorsal, b, lateral aspect.

Sculpture and pilosity much as in the worker; head, thorax and petiole somewhat paler, more piceous or reddish brown; gaster darker; mandibles, antennae, legs and genitalia brownish or sordid yellow. Wings colorless, with pale yellow veins and pterostigma.

Described from four workers, one female and seven males (No. 296), taken by Dr. Skwarra at Mirador, Vera Cruz in hollow twigs.

*MYRMELACHISTA* (*DECAMERA*) *SCHUMANNI* Emery var. *CORDINCOLA*  
var. nov.

*Worker.* Length 1.5-3 mm.

Averaging somewhat larger than the typical *schumanni* and differing in color. Brownish yellow, with the head and gaster brown, the latter usually darker than the former, the bases of the gastric segments paler than their posterior borders which are edged with black. Mandibles and anterior portion of head paler and more yellowish than the posterior portion. Antennae and legs yellow, the clubs of the former and in some specimens also the median part of the femora somewhat infuscated. Superior border of petiolar scale entire, its anterior surface distinctly convex, its posterior surface nearly flat.

Described from numerous specimens taken by Dr. W. M. Mann at Osunto, Bolivia in cauline swellings of *Cordia hispidissima*.

## MYRMELACHISTA (DECAMERA) ZELEDONI Emery

*Male* (undescribed). Length 2.4 mm.

Head without the mandibles decidedly broader than long, broad and semicircularly rounded behind, with large eyes and prominent ocelli, much narrowed in front, with straight, anteriorly converging cheeks. Mandibles well developed, with two large teeth. Clypeus very convex

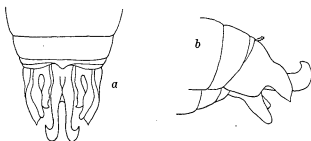


Fig. 5. Genitalia of male *Myrmelachista (Decamera) zeledoni* Emery; a, ventral, b, lateral aspect.

but not carinate in the middle, its anterior border broadly rounded and projecting. Antennæ 11-jointed, long; scapes reaching to the posterior ocelli; first funicular joint small, as broad as long; remaining joints decidedly longer than broad. Thorax robust, broader than the head; mesonotum broader than long, convex and hemispherically rounded anteriorly; epinotum small, scarcely convex, sloping, without differentiated base and declivity. Petiole small, nodiform, conical in profile, with blunt, entire, convex and rounded superior border. Gaster rather large, with large, exerted genitalia. (Fig. 5). Legs long and slender. Wings long, with a single elongate cubital and no discoidal cell.

Smooth and shining; pilosity consisting of a few short, erect hairs on the clypeus, thorax and gaster; pubescence undeveloped. Brown; head, mesopleuræ and outer genital valves darker, castaneous; mandibles, clypeus, antennæ and legs brownish yellow; sagittæ whitish; wings grayish, with pale brown veins and pterostigma.

In 1911 I found this species to be rather common in dead twigs at San Jose, Alajuela and Cartago, Costa Rica. Emery's type material came from the same region. He records a smoother variety, *thiemei*, of this species from Venezuela and Peru.

## MYRMELACHISTA (DECAMERA) ULEI Forel

Six workers collected by Dr. J. C. Bradley at Perené, Peru (July 1, 1920) agree perfectly with a cotype received many years ago from Professor Forel. Ule discovered the species in the swelling of the flower-stalk of a Melastomaceous plant (*Pterocladon sprucei* Hooker) at Cerro de Escaler, 1200 m., Peru. Bradley's specimens were probably taken in a similar situation.

## MYRMELACHISTA (DECAMERA) DONISTHORPEI sp. nov.

*Worker.* Length about 1.3 mm.

Head subrectangular, convex dorsally, as broad as long and nearly as broad in front as behind, with feebly convex sides and posterior border. Eyes rather flat, at the middle of the sides. Mandibles moderately convex, 5-toothed, the third and fifth tooth small. Clypeus broad, convex in the middle, anterior border transverse, nearly straight, without median denticle. Frontal area large, flat, subtriangular, with indistinct posterior boundary. Antennae rather long; scapes reaching nearly to the posterior border of the head; funicular joints 2-6 small, slightly broader than long, except the second, which is as long as broad; two basal joints of club longer than broad, together shorter than the terminal joint. Thorax rather robust, of the usual hour-glass shape, the mesoepinotal constriction short but deep, both dorsally and laterally; promesonotum large, convex and hemispherical, considerably elevated above the epinotum; metanotum short, with prominent spiracles, without posterior suture; epinotum in profile with feebly convex, horizontal base, distinctly shorter than the straight and sloping declivity. Petiole stout, posteriorly pedunculate; scale strongly inclined forward, very thick, nodiform, as thick at the summit, which is rounded and entire, as at the base. Gaster of the usual shape. Legs long and slender, fore femora distinctly enlarged.

Smooth and shining, minutely and sparsely punctate; mandibles delicately reticulate-punctate.

Hairs rather abundant, yellow, of uneven length, bristly, long on the body, shorter on the appendages, appressed on the femora, suberect and conspicuous on the tibiae, especially on the tarsi, funiculi and anterior surfaces of the scapes.

Pale yellow; mandibles reddish; vertex and middle of occiput with a large pale brown spot; gaster piceous or blackish.

A single specimen, taken by the Oxford University Expedition (1929) on Morabelli Creek, Essequibo River, British Guiana and



sent me for identification by Mr. Horace Donisthorpe. It is deposited in the British Museum together with a dealated female from the same locality and apparently belonging to the same species. This specimen unfortunately lacks the anterior half of the head. It is deep castaneous, with black gaster and yellow legs. Both body and legs are rather densely clothed with erect or suberect, coarse, yellow hairs, of uneven length. Petiolar scale or node broad and very thick, with transverse, somewhat sinuate superior border.

MYRMELACHISTA (DECAMERA) FLAVIDA sp. nov.

*Worker.* Length 1.3–1.5 mm.

Head flattened, subrectangular, about one sixth longer than broad, slightly narrower in front than behind, with nearly straight sides and slightly sinuate posterior border. Eyes flat, slightly in front of the middle of the sides. Mandibles moderately convex, somewhat geniculate at the base, 5-toothed, the third and fifth tooth minute. Clypeus convex in the middle, its anterior border sinuate on each side, broadly rounded in the middle, somewhat projecting and armed with a distinct denticle. Frontal area distinct, flat, triangular. Antennal scapes curved at the base, extending to about half the distance between their insertions and the posterior corners of the head; funicular joints 2–6 small, subequal, much broader than long; two basal joints of club slightly broader than long, together much shorter than the swollen terminal joint. Thorax slender, hour-glass shaped; pro- and mesonotum together forming an ovoidal mass, convex dorsally and laterally; mesoepinotal constriction deep and rather long; metanotal spiracles prominent, posterior metanotal suture obsolete. Epinotum seen from above ovoidal but smaller than the promesonotum; base in profile nearly straight, horizontal, decidedly longer than the somewhat concave, sloping declivity. Petiole as long as high, slightly pedunculate posteriorly, the scale small, thick, nodiform, inclined forward, its upper border rounded, seen from behind straight and entire. Gaster of the usual shape. Legs moderately long, fore femora slightly thickened.

Smooth and shining; mandibles delicately reticulate-punctate at their tips; thoracic constriction and metanotum subopaque, reticulately and on the sides longitudinally rugulose.

Pilosity delicate, yellowish, short and very meager; only a few scattered erect hairs on the clypeus, upper surface of the head, thorax and gaster. Pubescence very dilute, appressed, scarcely visible, except on the antennæ, tibiæ and posterior surface of the head.

Yellow; gaster and legs slightly paler than the head and thorax; borders and teeth of mandibles, anterior margin of clypeus and the frontal carinae reddish.

Described from six specimens which I collected at Kartabo, British Guiana, nesting in dead stems of a low Rubiaceae weed, *Borreria verticillata* L.

*M. flavida* is closely related to *nodigera* Mayr, *bambusarum* Forel and *bruchi* Santschi, but is, I believe, quite distinct.

BRACHYMYRMEX GAGATES sp. nov.

*Worker.* Length 2-2.5 mm.

Head rounded subrectangular and dorsally convex as in the other species of the genus; posterior border straight, with a slight median sinuation. Eyes rather large, flattened, a little behind the middle of the sides and less than twice their length from the anterior corners. Ocelli distinct. Mandibles small, with oblique 5-toothed terminal borders, the median tooth minute. Clypeus large, convex but ecarinate in the middle, its anterior border broadly rounded and projecting, concealing the closed mandibles. Frontal area subtriangular, not very sharply defined; frontal groove represented anteriorly as an indistinct longitudinal ridge but concave just in front of the anterior ocellus. Antennal scapes extending fully one-fourth their length beyond the posterior corners of the head; second funicular joint one and one-half times as long as broad, a little more than half as long as the first joint; joints 3-7 more than one and one-half times as long as broad, terminal joint as long as the two preceding subequal joints together. Thorax with strong and distinctly impressed promesonotal suture, interrupting the dorsal outline, and deep mesoëpinal impression; metaëpinal suture distinct, the prominent metanotal spiracles small, separated by more than five times their diameter. Pronotum broad and rounded, mesonotum less than twice as broad as long, very convex, projecting above the pronotum; metaëpinotum slightly longer than broad, trapezoidal, distinctly broader behind than in front; base and declivity of epinotum in profile straight and subequal, the former horizontal, the latter sloping, forming together a rounded but distinct obtuse angle. Petiolar scale small, thin and very narrow, its anterior surface concave above, its posterior surface feebly convex. Gaster voluminous, pointed posteriorly, its large first segment overlying the petiole and provided with a deep groove for

its accommodation. Legs stout, fore femora distinctly enlarged and somewhat compressed.

Very shining and very finely and superficially reticulate; basal half of mandibles obscurely striatopunctate; sides of thorax less shining than the dorsal surface; metapleuræ subopaque, finely and densely punctate.

Hairs reddish or brownish, pubescence whitish; the former sparse, erect and pointed, in several rows on the gastric segments, absent on the appendages. Pubescence short, distinct, appressed and dilute on the posterior portion of the head; absent on the thorax and abdomen; abundant and subappressed on the appendages, somewhat longer on the antennæ than on the legs.

Jet black; clypeus, tips of mandibles and insertions of antennæ red; sides of head, antennæ and legs dark brown; funiculi sometimes more reddish; tarsal joints beyond the metatarsi pale yellow; trochanters and neck yellowish brown.

Described from a dozen specimens (No. 607) taken by Dr. Skwarra at Mirador, Vera Cruz, in *Tillandsia streptophylla*. This species seems to be quite distinct from any of those included in Santschi's monograph of *Brachymyrmex* (1923). It runs to *incisus* Forel in his table, but typical specimens of this form from Panama in my collection show that it differs from *gagates* in having a narrower head, much less prominent mesonotum, indistinct and unimpressed promesonotal suture, shorter funicular joints, much paler coloration, etc.

CAMPONOTUS (MYRMAPHÆNUS) CRESSONI Ern. André

Three major and three minor workers (No. 279) taken by Dr. Skwarra at Mirador, Vera Cruz in dead stems of *Heliocarpus*, lying on the ground.

CAMPONOTUS (MYRMOBRACHYS) PHYTOPHILUS sp. nov.

*Worker major.* Length 4.5–5.3 mm.

Head rounded subrectangular, as broad as long, slightly broader behind than in front, with moderately convex sides and cheeks, rounded posterior corners and straight posterior border. Eyes rather large and flat, nearly three times their length from the anterior corners of the head. Mandibles convex, stout, with five strong teeth. Clypeus subrectangular, somewhat longer than broad, convex but not carinate in the middle, its anterior border with a rather deep median sinuation

flanked on each side by a broad, blunt tooth-like projection. Cheeks large, projecting slightly beyond the anterior border of the clypeus. Frontal carinae rather closely approximated in front, strongly diverging and subparallel behind; frontal groove distinct. Antennae slender; scapes curved at the base, enlarging towards their tips, which extend about twice their greatest diameter beyond the posterior border of the head. Thorax short, with strong, impressed promesonotal suture; in profile evenly arcuate throughout, since the epinotum is low, sloping and rounded, usually with only a faint suggestion of an angle between the base and declivity. Pronotum, without the neck, nearly twice as broad as long, flattened above, with bluntly submarginate sides and rounded humeri; mesonotum nearly as broad as long, rounded on the sides and anteriorly, where it is slightly elevated above the pronotum at the suture; epinotum narrow, longer than broad, subrectangular from above and rounded from side to side. Petiolar scale thick, nodiform in profile, nearly as thick above as below, convex in front and flattened behind; seen from behind rather narrow, broader at the superior border, which is straight and transverse, than below. Gaster broadly elliptical; legs stout.

Subopaque; head and thorax densely punctate; mandibles and posterior corners of head smoother and more shining; gaster and legs slightly more shining than the thorax; anterior half of head more coarsely punctate than the posterior half; clypeus, cheeks and front also with sparse, shallow, piligerous foveolae; petiole and gaster finely, sharply and transversely shagreened; mandibles, legs and scapes superficially shagreened, the mandibles also coarsely and sparsely punctate.

Hairs snow-white, coarse, erect and rather abundant; short, stubby and obtuse on the clypeus, front and cheeks, longer and more pointed on the occiput, thoracic dorsum and gaster, conspicuously long and numerous on the epinotum; short and oblique on the femora and scapes; abundant and almost squamiform on the tibiae.

Black; femora dark brown; scapes, first funicular joint, tibiae and tarsi more reddish.

*Worker.* Length 3-3.5 mm.

Head trapezoidal, longer than broad, with straight somewhat flattened, anteriorly converging sides and feebly convex posterior border, without a distinct ridge from the posterior corners to the eyes, which are large and very near the latter. Mandibles small, less convex than in the major worker. Clypeus subcarinate. Antennal scapes nearly straight, extending half their length beyond the posterior border of the head. Thorax like that of the major but less convexly arcuate.

Sculpture and pilosity as in the major. Black; legs deep piceous brown or black; tips of mandibles, basal two thirds of antennal scapes and tarsi paler, more yellowish brown.

*Female* (deälated). Length 5.5-6 mm.

Head resembling that of the minor worker in shape, but larger, with larger, more convex eyes. Clypeus feebly and evenly convex, ecarinate. Thorax narrower than the head, elongate oval, three times as long as broad; mesonotum longer than broad, epinotum short, the base convex and rounded, passing with an even curve into the longer, straight and nearly perpendicular declivity. Petiole like that of the worker forms but even thicker and more nodiform.

Surface of body, especially the occiput, thorax and gaster smoother and more shining; pilosity like that of the major but more abundant, longer on the head. Black; mandibles entirely or only at their tips deep red, as are also the scapes, first funicular joint and tarsi.

*Male*. Length 3.2 mm..

Head through the large, convex eyes as broad as long, broad and semicircularly rounded behind; ocelli prominent; cheeks slightly concave, subparallel. Mandibles slender, gradually widened at their tips which bear an acute terminal denticle. Clypeus subcarinate. First funicular joint enlarged, pyriform; terminal joints short. Thorax broader than the head, about two and one-half times as long as broad. Mesonotum large, somewhat longer than broad; epinotum in profile evenly rounded, without distinct base and declivity. Petiole much as in the worker minor but somewhat lower, as thick above as below, the superior surface straight and transverse. Gaster small and narrow; legs slender.

Sculpture and pilosity as in the female, but the hairs on the head are long, pointed, and of more uneven length. Black, including the mandibles; legs dark brown; tarsi and funiculi somewhat paler. Wings white, with pale yellow veins and pterostigma.

Described from many workers, two females and a male taken from numerous colonies by Dr. Skwarra at Cuernavaca, Morelos (type-locality) in *Tillandsia circinata* (Nos. 765a, 775, 776, 781, 834, 839a, 842, 848, 849, 855, 856, 866, 870, 871, 876) and Mirador, Vera Cruz in *Tillandsia streptophylla* (187a) and in stems of *Ricinus communis* (718).

Minor workers of this species which I collected at Cuernavaca in 1900, attending Membracids on a tall Umbelliferous plant, were identified and recorded by Forel (Ann. Soc. Ent. Belge 1901) as "*Camponotus mina* Forel", but I find that they represent quite a distinct species, now that Dr. Skwarra has discovered the major

worker. *C. mina* is much larger, with differently shaped head, epinotum and petiole and different coloration of legs and antennæ, pale borders to the gastric segments, etc.

CAMPONOTUS (MYRMOBRACHYS) STRIATUS F. Smith

Three minor workers taken by Dr. Skwarra at Camaron, Vera Cruz, in spines of *Acacia sphærocephala*.

CAMPONOTUS (MANNIELLA) LINNÆI Forel

In 1870 Mayr described from Colombia a minor worker of *Camponotus* as *angulatus*, but as this name was preoccupied, it was changed by Forel in 1886 to *linnæi*. He later described in the *Biologia Centrali-Americana* (1899) a subspecies *muticus*, also from a minor worker. Emery (*Genera Insectorum* 1925) placed the species in the subgenus *Myrmeurynota*. I have repeatedly taken *linnæi* in various neotropical localities, always nesting in dead twigs, and have noticed that a colony consists of only one or two dozen minor workers and a few soldiers. The worker caste is therefore strongly dimorphic as in the species of *Colobopsis*. From the fact that I have never found a female in any of the colonies I infer that this caste is, perhaps, functionally replaced by the soldier. This remarkable, hitherto undescribed phase shows very clearly that *linnæi* belongs to the subgenus *Manniella*, and is closely related to *C. championi* Forel, a species which should, therefore, be removed from the subgenus *Myrmobrachys*, where it was placed by Emery, and also assigned to *Manniella*. Among the specimens of *linnæi* before me three different forms may be distinguished: the typical form, one closely related to if not the same as Forel's *muticus*, and an undescribed form from British Guiana.

CAMPONOTUS (MANNIELLA) LINNÆI (typical)

*Soldier* (undescribed). Length about 6 mm.

Head large, very slightly longer than broad, high and rounded posteriorly, with straight, subparallel sides, large swollen cheeks, broadly and distinctly convex posterior corners; in profile obliquely truncated and flattened anteriorly as far back as the antennal insertions, much as in some species of *Colobopsis*, but with the lateral borders of the truncation rounded, or submarginate. Mandibles short, stout, with five subequal teeth. Eyes large, broadly elliptical, not very convex, near the posterior corners of the head. Clypeus trapezoidal, one and two-thirds times as long as broad, nearly twice

as broad in front as behind, with straight sides, flat or slightly concave surface and sharp, narrow median carina, the anterior border rounded, very finely crenulate, not projecting as far forward as the anterior borders of the cheeks. Their truncated portions at the sides of the clypeus distinctly concave and confluent foveolate much as in *C. (Manniella) ulcerosus* Wheeler. Frontal area minute, transversely trapezoidal; frontal carinae strongly diverging and straight posteriorly, bordering deep scrobe-like grooves, or backward prolongations of the antennal foveae, which are nearly half as long as the scapes; frontal groove distinct, continued back to the level of the middle of the eyes. Antennae slender; scapes strongly curved and somewhat flattened at the base, somewhat thickened apically, extending fully twice their greatest diameter beyond the posterior border of the head. Thorax short, its dorsal outline regularly and moderately arcuate, interrupted only at the impressed promesonotal and mesoepinotal sutures. Pronotum, without the neck, more than twice as broad as long, flattened above, sharply marginate on the sides, with blunt humeral angles and feebly bisinuate anterior border. Mesonotum from above narrower than the pronotum, rounded-subhexagonal; epinotum higher than long, its base from above subtriangular, nearly as broad as long, decidedly shorter than the straight or slightly concave and rather steep declivity with which it forms a very distinct obtuse angle. Petiolar scale rather broad, its superior border acute, semicircularly rounded, its sides straight, ventrally converging, its anterior surface convex in profile, its posterior surface flat, with a median perpendicular impression. Gaster elliptical, its first segment anteriorly truncated and distinctly submarginate on the sides. Legs rather stout; fore femora enlarged; hind tibiae slightly compressed, without spinules on their flexor surfaces.

Nearly opaque, except the legs, scapes, posterior corners of the head, neck, sutures of thorax, petiole and median portion of epinotal declivity, which are distinctly shining. Head and thorax densely punctulate; mandibles more finely, with larger, sparser punctures; petiole and middle of epinotal declivity transversely shagreened; gaster densely and microscopically, scapes and legs indistinctly punctulate.

Hairs whitish; absent on the truncated surface of the head; very short, erect, stout and clavate on the mandibles and cheeks; numerous, somewhat larger and mostly obtuse on the front and vertex; much longer, pointed and sparse on the thorax, petiole and gaster. Occiput and dorsal surface of thorax and gaster also with coarse, sparse, appressed, subsquamiform hairs, or long pubescence, which is easily

rubbed off. Legs and antennæ with very short, fine appressed pubescence; the scapes also with a few long, erect hairs on their anterior surfaces and tips.

Black; mandibles and head pale ivory yellow; posterior half of sides reddish; mandibular teeth, posterior portion of gula, frontal area, deepest portions of antennal scrobes, a short line at the anterior end of each lateral clypeal suture, and a large transverse area of the occiput bounded anteriorly by an irregular line connecting the posterior orbits and these with the posterior corners of the head, black. Sutures surrounding the clypeus reddish. Gastric segments with broad, sharply defined and somewhat satiny, milk white posterior and lateral borders, both on the dorsal and ventral sides. Antennal scapes yellow, the funiculi more ferruginous red; femora dark brown or even black; tibiæ and tarsi dark red.

*Worker minor.* Length 4-4.5 mm.

Head small, trapezoidal, somewhat longer than broad, with straight, compressed, anteriorly converging sides, feebly convex posterior border and large, convex, posteriorly placed eyes connected with the posterior corners by distinct ridges; anterior surface not truncated, of the usual shape. Clypeus carinate, anteriorly broader than long. Mandibles less convex than in the soldier, frontal carinæ less approximated anteriorly; scrobe-like grooves absent. Thorax and petiole shaped much as in the soldier, but the pronotum is longer in proportion to its width, even more sharply marginate laterally and with more pronounced, slightly upturned anterior corners.

Sculpture like that of the soldier, but posterior corners of the head opaque and finely punctulate like the remainder of the surface. Pilosity similar, but the long erect hairs are less numerous, the appressed pubescence more conspicuous, the hairs on the clypeus and cheeks obtuse but longer than in the soldier. Color the same, but the whole head is black, except the mandibles and anterior borders of the cheeks, which are brownish yellow. Legs darker than in the soldier; femora more frequently black, the tibiæ and tarsi deep red; gastric segments conspicuously bordered with white as in the soldier.

*Male* (undescribed). Length nearly 5 mm.

Head of the usual form; mandibles with oblique, edentate terminal borders; clypeus small, subcarinate. Thorax robust, broader than the head; mesonotum as broad as long; epinotum with short, convex base rounding into the longer straight and sloping declivity. Petiole low, nodiform, nearly twice as broad as long, thick below, with rather sharp, broadly rounded, entire superior border.



Smooth and lustrous; head more opaque posteriorly. Pilosity very sparse, erect, distinct on the head, scutellum and gaster, very short and inconspicuous on the mesonotum; pubescence undeveloped; scapes and legs naked. Deep castaneous brown, appendages and thoracic sutures somewhat paler; posterior portion of head black; mandibles, anterior borders of cheeks and genitalia yellow; posterior borders of gastric segments narrowly brownish yellow; wings somewhat yellowish, with resin-yellow veins and brown pterostigma.

This form was originally described from Colombia. The preceding description was drawn from a number of specimens which I collected during 1911, 1912 and 1924 in dead twigs at Gatuncillo, Monte Lirio and Barro Colorado Island in the Canal Zone, Panama.

*CAMPONOTUS (MANNIELLA) LINNÆI MACCUS* subsp. nov.

*Soldier.* Differing from the soldier of the typical *linnæi* in the following characters: punctulation of the head and thorax somewhat coarser and the surface somewhat less opaque and more lustrous; front and sides of head sparsely but distinctly foveolate; posterior half of sides of head more deeply red; the black occipital area more extensive, reaching forward to the posterior ends of the frontal carinae and becoming confluent with the black in the scrobal grooves. Legs uniformly red; scapes yellow; funiculi ferruginous, paler than the legs.

*Worker.* Very similar to the worker of the typical *linnæi* but the antennal scapes are slightly longer, more slender and more yellowish and the legs are decidedly paler, being brownish red throughout, the white borders of the gastric segments slightly broader and more conspicuous.

Described from four soldiers and numerous workers taken by myself in hollow twigs at Kartabo and on Kaow Island, in the Mazaruni River, British Guiana.

*CAMPONOTUS (MANNIELLA) LINNÆI COMÆDUS* subsp. nov.

*Soldier.* Differing from the soldier of the typical *linnæi* in having the epinotum thicker above, with the base more rounded and not forming so distinct an angle with the declivity in profile. The petiolar scale is also thicker, more convex behind and with less acute superior border. The front is covered with shallow, reddish foveolæ, and the paler portions of the head are distinctly duller and more brownish ivory yellow, the funiculi are yellow only at the base and the legs are paler, yellowish ferruginous or red, in some specimens with slightly

brownish femora. The long, appressed squamiform pubescence seems to be coarser and more abundant.

*Worker.* Differing from the worker of the typical *linnaei* in the somewhat less developed anterior angles of the pronotum, the thicker and blunter epinotal angle and petiolar scale and the more abundant pubescence. The legs, though darker than those of the soldier are paler than those of the typical *linnaei* worker.

Described from three soldiers and three workers (No. 473) taken by Dr. Skwarra at Camaron, Vera Cruz (type-locality) in a pseudobulb of *Schomburgkia tibicinis*, a soldier and numerous workers taken by myself in hollow twigs at Escuintla and Patulul, Guatemala, and a single worker taken at Izalco, Salvador by Frederick Knab.

As previously stated, this subspecies may be synonymous with the subsp. *muticus*, but since Forel's description is based only on workers from Costa Rica (Tonduz) and Santa Marta, Colombia (Forel), the introduction of a new name seems preferable to the risk of a dubious identification.

*C. championi* Forel from the states of Vera Cruz and Tabasco, Mexico, and the Volcan de Chiriqui, Panama, is certainly closely related to *linnaei*, but differs in coloration and in the shape of the pronotum and epinotum. Forel's Fig. 21a must be erroneous, because it shows the head of the soldier as greatly and quite asymmetrically (!) narrowed anteriorly, whereas the description, apart from unimportant details, agrees closely with the head of *linnaei*.

#### CAMPONOTUS (COLOBOPSIS) CERBERULUS Emery

This species was described by Emery in 1920 from a winged female taken in the state of Michoacan, Mexico. The description agrees so closely with a lot of females and males which I took at night in Texas Pass, Dragon Mts., Arizona on July 20, 1917, that I regard them as conspecific. I have received specimens of the same sexes also from Sabino Basin, Santa Catalina Mts. and Black Dike Prospect, Sierritas in the same state. Moreover, I believe that three specimens (No. V13b) taken by Dr. Skwarra from spines of *Acacia sphaerocephala* on the sand dunes near Vera Cruz, represent the hitherto unknown soldier of *cerberulus*. I therefore append descriptions of this caste and of the male.

*Soldier* (undescribed). Length 5 mm.

Head proportionally larger and broader than in the female, but very distinctly longer than broad, parallel-sided anteriorly (in one specimen

expanded at the sharp edge of the anterior truncation). Eyes flattened, fully twice their length from the border of the truncation. Antennal scapes extending a distance equal to their greatest diameter beyond the posterior corners of the head. Mandibles thick and flat, with five stout, subequal teeth. Clypeus one and two-thirds times as long as broad, narrowed in front, the portion behind and bordering the truncation nearly four times as broad as long; frontal area minute, transverse, impressed; frontal carinæ straight, strongly diverging behind; frontal groove very delicate anteriorly but terminating on the vertex as a strong, elongate impression. Thorax stout, narrower than the head; in profile impressed at the promesonotal and more deeply and widely at the mesoëpinotal suture; the mesonotum convex, distinctly higher than the pro- and epinotum; pronotum from above very broad, convex and semicircularly rounded anteriorly, somewhat less than twice as broad as long; promesonotal suture semicircularly arcuate; mesonotum broadly, transversely elliptical; epinotum as long as broad, rounded-subcuboidal, its base in profile short, feebly convex, somewhat more than half as long as the rather steep, inferiorly concave declivity. Petiolar scale low, thick and nodiform, slightly more than twice as broad as long, nearly as thick above as below, with flattened anterior and posterior surfaces, the thick, transverse superior border strongly impressed in the middle behind. Gaster elongate elliptical. Fore femora incrassated.

Shining and extremely finely shagreened, except the mandibles and anterior two-fifths of the head which are opaque, the former finely punctate-rugulose, the latter foveolate-reticulate.

Hairs white, short, erect, extremely sparse on the posterior portion of the head, absent on the thorax, petiole and appendages. Mandibles and lateral borders of cephalic truncation with very short, stiff, blunt hairs. Pubescence dilute, very short and fine, visible only on the legs and antennæ.

Deep piceous brown or black; mandibles, truncated surface and about two-fifths of the head surrounding it, tips of scapes, funiculi, tarsi and sutures of the thorax, petiole and legs, red.

*Male* (undescribed). Length 3 mm.

Head through the eyes broader than long, its posterior border straight in the middle, convex on the sides. Eyes large and convex, ocelli prominent and widely separated. Cheeks rather short, converging anteriorly. Mandibles small, narrow, with acute apical tooth. Clypeus convex and subcarinate in the middle. Antennæ slender, with enlarged, pyriform first funicular joint and short terminal joints. Thorax

nearly as broad as the head through the eyes; mesonotum large, high and convex anteriorly, nearly as broad as long; epinotum small, rounded, without distinct base or declivity. Petiolar node lower, narrower than in the soldier, thick and rounded above in profile, without median impression behind. Gaster and legs slender.

Smooth and shining throughout. Pilosity very meager, confined to vertex, posterior portion and tip of gaster; pubescence very fine and sparse on the appendages.

Brown; head black behind; tarsi, mandibles and thoracic sutures yellowish. Wings clear, iridescent, with very pale yellowish veins and pterostigma.

#### CAMPONOTUS (COLOBOPSIS) ETIOLATUS Wheeler

In 1904 I described (Bull. Amer. Mus. Nat. Hist. 20, p. 150) all four castes of this ant from specimens which I collected in live-oak galls in Texas as a mere variety of *abditus*, a species described by Forel (Biol. Centr. Amer. 1899, p. 158) from a single female taken by Champion in Guatemala. Dr. Skwarra has now taken the four castes of this species in Mexico. From their examination I conclude that the Texan form deserves to rank as a distinct though closely allied species. I therefore confine the following account mainly to a comparison of the soldier, worker, female and male with the corresponding castes of *etiolatus*.

#### CAMPONOTUS (COLOBOPSIS) ABDITUS Forel

*Soldier* (undescribed). Length 5-6 mm.

Head distinctly larger and proportionally longer than in *etiolatus*, the truncated surface less circular and more transversely elliptical, the portion of the clypeus behind the truncation fully twice as long in proportion to its width. Meso- and epinotum more compressed laterally, the base of the latter less convex, the declivity usually less concave. Petiolar scale thicker, impressed in the middle behind. Sculpture of the truncation and adjacent portion of the head decidedly finer, the foveolæ on the cheeks more distinct and less confluent, and these regions lacking the numerous, blunt, erect hairs of *etiolatus*. Color of posterior portion of head, of the thorax, petiole and appendages more sordid brownish yellow and less reddish yellow than in *etiolatus*, and the vertex, thoracic dorsum and summit of petiole more or less clouded with brown. Gastric segments with darker, broader and less clearly defined fasciæ and usually lacking the yellow margins

of *etiolatus*. In most cases the whole gaster is castaneous brown except the bases of the first and second segments.

*Worker* (undescribed). Length 3.5-4 mm.

Head distinctly larger, broader and more convex behind than in *etiolatus*; antennal scapes shorter; epinotum more compressed laterally. Petiolar scale more subelliptical from behind, with shorter, more deeply sinuate superior border. Sordid brownish yellow, with posterior portion of head, petiole and thoracic dorsum extensively clouded with brown; gaster castaneous or dark brown throughout, or more rarely with the bases of the first and second segments yellow.

*Female* (deälated). Length 7-7.5 mm.

Larger than the female of *etiolatus*. Head like that of the soldier, larger and broader than in the female of that species; scapes shorter, extending only a distance equal to their greatest diameter beyond the posterior corners of the head (in *etiolatus* two or three times as far); posterior border of truncation more pronounced, its sculpture finer and the cheeks, as in the soldier, with erect hairs. Petiole less thickened than in *etiolatus*. Coloration as in the soldier.

*Male* (undescribed). Length 4-4.5 mm.

Very similar in form to the male of *etiolatus* but distinctly different in coloration. Head, thorax and appendages pale sordid yellow; ocellar region and gaster dark brown. In *etiolatus* the head, thorax, gaster, and femora are brown and only the tibiae, tarsi, antennae and thoracic sutures are yellow. In *abditus* the wings are whitish, the veins and pterostigma very pale yellow; in *etiolatus* these structures are resin yellow, the pterostigma sometimes brown.

Specimens from 11 colonies taken by Dr. Skwarra at Fortin (No. 373) in stems of *Acacia pennatula* and Mirador (Nos. 14, 224, 274, 428, 431, 433, 435, 452, 458, 565a) in hollow stems and twigs of *Heliocarpus appendiculatus* Turcz, *Conostegia zalapensis* and several undetermined plants.

#### CAMPONOTUS (CÔLOBOPSIS) TRITON sp. nov.

*Female*. Length 6.3 mm.

Head about one fourth longer than broad, with straight, parallel sides and broadly rounded anterior and posterior corners; posterior border broadly convex; the anterior truncation, which has a very blunt border both laterally and posteriorly, extending back to the posterior fourth of the clypeus. Eyes large, moderately convex, distant less than half their length from the posterior, and fully twice their length from

the anterior corners of the head. Mandibles 6-toothed, stout, flattened, with moderately convex external borders. Clypeus flattened anteriorly, convex posteriorly, ecarinate, suboblong, nearly one fourth longer than broad, slightly broader behind than in front, its anterior and lateral borders crenulate, its posterior border notched in the middle. Frontal area absent; frontal groove distinct, extending back to the anterior ocellus; frontal carinae straight, widely separated and diverging, reaching beyond the median level of the eyes. Antennal scapes rather stout, curved at the base, their tips reaching nearly one third their length beyond the posterior corners. Thorax broader than the head, elongate-elliptical, nearly two and one-half times as long as broad; mesonotum somewhat longer than broad; epinotum short and convex, without differentiated base and declivity. Petiolar scale low, nodiform, nearly twice as broad as long, rounded anteriorly, posteriorly, laterally and dorsally. Gaster elongate-elliptical. Legs rather slender.

Shining and very finely shagreened; mandibles and anterior half of head more opaque, sharply and regularly reticulate-rugose; the mandibles also finely punctate between the meshes.

Pilosity yellow, short, erect, absent on the thorax and petiole, sparse on the gaster; mandibles and anterior half of head with numerous short, erect, blunt and clavate hairs. Pubescence pale, short, appressed, visible only on the legs and antennae.

Yellow; gaster paler, more whitish yellow than the thorax, petiole and legs, fifth segment entirely and fourth except at the base, deep castaneous. Head, mandibles and antennae reddish yellow, with the occipital region paler and of the same color as the thorax. Insertions of wings with a small black spot. Wings whitish, with very pale, whitish yellow veins and pterostigma.

A single specimen taken at Fresh Creek, Andros Island, Bahamas by Dr. W. M. Mann. I have described this species from a female, because its coloration is so striking that it can be very readily recognized.

CAMPONOTUS (COLOBOPSIS) CORDINCOLA sp. nov.

*Soldier.* Length 5-5.5 mm.

Head very regularly oblong, with rectangular anterior and posterior corners, fully one third longer than broad without the mandibles; in profile higher in front than behind, obliquely truncated as far back as the beginning of the frontal carinae, the truncation concave and bluntly rounded (not marginate) on the sides. Mandibles 6-toothed, as broad as long, flattened above, with very convex external borders.

Cheeks somewhat swollen dorsally, with straight, transverse, anterior borders projecting beyond the clypeus, which is flat and ecarinate, suboblong, about one fourth longer than broad, slightly narrower in front than behind, with a short median groove at the posterior end and feebly trilobulate anterior border. Frontal area large, trapezoidal; frontal groove distinct, extending back to a shallow pit on the vertex; frontal carinae pronounced, diverging, parallel behind and continued back as far as the median level of the eyes. Eyes small, flat, distant only slightly more than their greatest diameter from the posterior, and three times this diameter from the anterior corners of the head. Antennae slender; scapes inserted at the middle of the frontal carinae, curved, somewhat enlarged at their tips which reach the posterior corners of the head. Thorax stout, not much longer than the head and mandibles, with evenly but not strongly arcuate dorsal outline, interrupted only by the pronounced promesonotal and mesoepinotal sutures; metanotum clearly indicated but bounded behind by a transverse groove instead of a suture; epinotum strongly compressed laterally, in profile with feebly and evenly convex base, rounding into the shorter, rather steep, concave declivity. Petiolar scale rather small, somewhat more than twice as broad as long, its anterior surface convex, its posterior surface flat, its superior border thick, blunt, broadly rounded and feebly impressed or sinuate in the middle. Gaster elongate-elliptical. Legs rather stout; fore femora incrassated.

Shining and finely shagreened; mandibles and head, except its posterior fourth, more opaque and more coarsely shagreened; mandibles also finely punctate; cheeks with somewhat larger, shallow and not very conspicuous punctures.

Hairs yellow, short, erect and sparse, only on the dorsal surface of the head, thorax, petiolar border and borders of the gastric segments. Pubescence very fine, short, appressed, visible only on the antennae, tibiae and tarsi.

Head reddish yellow, mandibles red with black teeth; frontal carinae, anterior margins of cheeks, anterior and lateral margins of clypeus and the frontal carinae deep red. Thorax, gaster and appendages yellow, the thorax somewhat darker; each gastric segment above, except at its base and posterior border, brown.

Described from three specimens which I took from a cauline swelling of *Cordia alliodora* on Barro Colorado Island, Panama.

I have placed this species in the subgenus *Colobopsis* though it resembles in the shape of its head certain species which Emery has assigned to his subgenus *Pseudocolobopsis*.

## CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS Emery

The typical form of this species was described by Emery as long ago as 1890 from workers collected in Costa Rica. There are several subspecies and varieties, all of which can be recognized among the material in my collection. None of the forms is common, probably because they all live in rather small colonies in dead twigs or epiphytic Tillandsias and forage singly on the foliage of trees and shrubs. The paler species are, perhaps, nocturnal.

The typical *rectangularis* is rich yellowish or testaceous, with the mandibles, anterior part of head and posterior borders of the gastric segments yellow; the tibiæ and tarsi red, the antennal funiculi beyond the first joint infuscated. I have seen workers of this form from the following localities: British Honduras: Manatee (J. D. Johnson) and Belize; Nicaragua: Chinandega (C. F. Baker); Guatemala: Patulul (Wheeler). It has been recorded also from Bugaba, Panama (Champion) and, as previously stated, from Costa Rica (Liberia and Bagaces (Alfaro); Surubres, near San Mateo (Biolley)). The various subspecies and varieties may be readily distinguished by means of the following key:

1. Posterior border of base of epinotum distinctly less sharply marginate than its sides; mesonotum and base of epinotum indistinctly or very finely reticulate . . . . . 2  
     Posterior border of base of epinotum as sharply marginate as its sides; mesonotum and base of epinotum more sharply reticulate . . . . . 6
2. Thorax and gaster concolorous . . . . . 3  
     Gaster much darker than thorax . . . . . 5
3. Thorax and gaster not black . . . . . 4  
     Thorax and gaster black. Mexico . . . . .  
         . . . . . subsp. *rubroniger* Forel var. *willowsi* Wheeler
4. Head, thorax, petiole and gaster yellowish ferruginous. Central America . . . . . *rectangularis* Emery, typical  
     Head, thorax, petiole and gaster sordid brown. Peru . . . . .  
         . . . . . var. *sordidatus* var. nov.
5. Thorax darker red posteriorly, gaster black throughout. Mexico . . . . .  
     . . . . . subsp. *rubroniger* Forel, typical  
     Thorax not darker posteriorly, base of gaster red. Guatemala . . . . .  
         . . . . . var. *aulicus* Wheeler
6. Legs with conspicuous, suberect hairs. Trinidad and British Guiana . . . . . subsp. *setipes* Forel  
     Legs without such hairs. British Guiana . . . . . var. *ligatus* var. nov.



## CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS Emery var.

## SORDIDATUS var. nov.

*Worker.* Differing from the typical form of the species in color, the body and femora being of a rather pale, sordid brown, the tibiæ, tarsi and scapes darker brown, the mandibles and anterior portion of the head dull brownish white. The pubescence on the tibiæ is slightly coarser and less appressed; the base of the epinotum distinctly broader than long.

Described from fifteen workers taken by Dr. J. C. Bradley at Perene, Peru.

## CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS RUBRONIGER

## Forel

*Worker.* Differing from the preceding forms in sculpture, pilosity and color. Mesonotum and base of epinotum somewhat more distinctly reticulate; erect hairs absent on the thoracic dorsum and few or absent on the top of the head. Pubescence short, pale, appressed and rather sparse, longest on the gaster, coarser and sparser on the tibiæ. Head, thorax and petiole deep red, the meso- and metanotum darker than the pronotum; mandibles and anterior portion of head yellow; scapes deeper red than the posterior portion of the head; legs dark red, the middle and hind pairs more blackish than the anterior pair.

*Female* (undescribed). Length nearly 9 mm.

Robust; head, without the mandibles, broader than long, proportionally much broader behind than in the worker major; scapes extending fully one fourth their length beyond the posterior corners of the head. Thorax of the usual structure in *Camponotus* females, not broader than the head; scutellum and posterior portion of mesonotum very flat, the latter scarcely broader than long. Epinotum with moderately convex base, rounding into the longer, rather concave declivity. Petiolar border broad and acute, emarginate in the middle. Gaster broadly elliptical. Fore wings measuring a little over 8 mm.

Subopaque, rather smooth, very finely shagreened; thorax without reticulate sculpture. Legs sparsely punctate. Pilosity as in the worker, but mesonotum with a few erect hairs. Color like that of the worker; parapsidal furrows, their borders and the middle or whole of the epino-

tum, black. Wings distinctly yellowish, with resin yellow veins and brown pterostigma.

*Male* (undescribed). Length 5 mm.

Head through the large, convex eyes as broad as long, broadly rounded behind, narrowed in front, the cheeks slightly concave, anteriorly converging, nearly as long as the eyes. Mandibles spatulate, with pointed tips, but otherwise edentate. Thorax much broader than head; mesonotum large, as broad as long, very convex anteriorly; scutellum convex, epinotum small, rounded, sloping, without distinct base and declivity. Petiole low, transverse, thick ventrally, its anterior surface bevelled above, its posterior face flat, its superior border entire and rather sharp. Gaster broad. Legs long and slender.

Sculpture like that of the female. Hairs white, few in number on head, absent on thorax and petiole, rather long and abundant on terminal gastric segments. Black; mandibles, wing-insertions and portions of genitalia brownish yellow. Wings paler than in the female, yellowish only along the anterior border; veins also paler; pterostigma brown.

This form was originally described from La Union, Salvador (Champion). In 1900 I took it at Cuernavaca, Morelos, Mexico in *Tillandsias* growing on acacias and guavas, in parabiosis with colonies of *Cryptocerus* and *Crematogaster*. More recently Dr. Skwarra secured many colonies in the same locality (Nos. 764, 784a, 814, 829, 830, 862, 863) nesting in *Tillandsia circinata* and *T. streptophylla*.

CAMPONOTUS (MYRMOCLADECUS) RECTANGULARIS RUBRONIGER  
var. AULICUS Wheeler

*Worker*. Resembling the typical *rubroniger*, but the head, thorax and petiole more vivid red, the base of the first gastric segment of the same color and each gastric segment reddish posteriorly, with the extreme border golden yellow. Appendages, especially the tibiae and tarsi, somewhat darker red than the head and thorax; cheeks, clypeus and mandibles more yellowish, the funiculi beyond the first joint blackish as in the other forms of the species. Dorsal surface of gaster with the same short pubescence and pile as in the typical *rectangularis* and the subsp. *rubroniger*.

Described from sixteen specimens which I extracted from a hollow twig at Zacapa, Guatemala, Dec. 13, 1911.

CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS RUBRONIGER  
var. WILLOWSI var. nov.

*Worker.* Differing from the typical form of the species and its var. *rubroniger* in coloration, being deep black, with the exception of the posterior borders of the gastric segments and terminal tarsal joints, which are reddish, and the head, antennal scapes and first funicular joint, which are bright yellowish red. Cheeks, clypeus and mandibles yellow, mandibular teeth reddish. Dorsal surface of gaster less opaque and more glossy than in *rectangularis* and *rubroniger*, with distinctly longer and denser pubescence and even shorter hairs.

Two specimens from Acapulco, Mexico, one taken by Mr. M. Willows, Jr. and one by Frederick Knab.

CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS SETIPES Forel

*Worker.* Of the same color as the typical *rectangularis* but differing in having the straight posterior border of the base of the epinotum more sharply marginate, the base itself, which is distinctly broader than long, and the mesonotum distinctly more coarsely reticulate-rugulose, the hairs on the dorsal surface of the body much more numerous and the legs and especially the tibiae with long, sparse, bristly suberect hairs.

Two workers from St. Augustine and Cumuto, Trinidad (P. J. Darlington) and several from the Wenamu River, British Guiana (W. J. Lavarre).

This form was described as a variety but deserves to rank as a subspecies.

CAMPONOTUS (MYRMOCLADÆCUS) RECTANGULARIS SETIPES  
var. LIGATUS var. nov.

*Worker.* Precisely like the typical *setipes*, but the long pilosity on the legs is replaced by very short, subappressed hairs or coarse pubescence, which, however, is distinctly longer than in the typical *rectangularis*.

Seven specimens from British Guiana, five from Kartabo, type-locality (Wheeler), one from Bartica (W. Beebe), and one from Tumatumari (F. E. Lutz).

## CAMPONOTUS (MYRMOCLADÆCUS) LATANGULUS Roger

Although this species was described from Surinam as long ago as 1863 it is infrequently mentioned in the literature, probably because it has been taken only occasionally in sweepings. Two colonies which I found in British Guiana were nesting in dead branches. One of them contained a number of specimens of the hitherto unknown female.

*Female* (undescribed). Length 8-9 mm.

Head trapezoidal, as broad as long, narrowed anteriorly, with straight sides and posterior border and nearly rectangular posterior corners. Antennal scapes extending somewhat more than their greatest diameter beyond the posterior corners of the head. Thorax slightly broader than the head, with pro- and mesonotum of the usual shape in female Camponoti; epinotum with sharply differentiated base and declivity, the former nearly twice as broad as long, broader anteriorly than posteriorly, strongly convex, with a shallow median groove, its posterior border distinctly emarginate in the middle and rather sharp, forming an acute angle with the concave and rather steep declivity, much as in the worker. Petiole not truncated above as in the worker, but cuneate as in most Camponoti, with only anterior and posterior surfaces, the former convex and perpendicular, the latter flat and sloping, the superior border broadly rounded, acute and entire, or occasionally emarginate in the middle. Gaster elongate elliptical. Wings rather short, measuring slightly more than 7 mm.

Sculpture, pilosity and color as in the worker, but the vertex with a large, brown, butterfly-shaped spot and each gastric segment posteriorly with a broad brown fascia sharply marked off from the yellow border of the segment but anteriorly shading into the yellowish ferruginous basal portion. Knees, tibiæ and tarsi of middle and hind legs darker brown than in the worker. Wings yellow, with deep resin yellow veins and pterostigma.

A number of workers and females from Kalocoon, Kartabo and Bartica, British Guiana (Wheeler). I have recorded the species also from Port of Spain, Trinidad (R. Thaxter) and have received specimens from San Antonio del Río Cotuhe and La Chorrera, Putumayo Distr., Peru (J. C. Bradley). Goeldi took it at Pará, in Northern Brazil, Jelski in Cayenne, and Emery records it from Bolivia. It seems, therefore, to have a rather circumscribed range and to be confined to South America.

## CAMPONOTUS (MYRMOCLADÆCUS) TRIPARTITUS Mayr

Six workers from Petropolis, Brazil (Thomas Borgmeier) agree closely with Mayr's description of the types from Santa Catharina, in the same country.

## CAMPONOTUS (MYRMOCLADÆCUS) BIDENS Mayr

I have taken numerous colonies of this species from dead twigs in the following localities in Panama: Frijoles, Corozal, Red Tank, Gatuncillo, Mandingo, Mt. Hope and Barro Colorado Island.

The dealated *female* (undescribed) measures nearly 7 mm. and is long and slender. Head slightly longer than broad, subtrapezoidal, nearly as wide in front as behind, with straight sides and distinctly convex posterior border. Eyes large, moderately convex, distant nearly one and one-half times their length from the anterior corners of the head. Mandibles convex, 6-toothed. Clypeus very convex and rounded in the middle, depressed on the sides, its anterior border sinuate medially and on each side. Antennal scapes extending nearly twice their greatest diameter beyond the posterior border of the head. Thorax elongate-elliptical, more than twice as long as broad, narrower than the head; mesonotum longer than broad; epinotum with very convex, backwardly sloping base, forming a distinct angle in profile with the longer, perpendicular, slightly concave declivity. Petiolar scale thick, transverse, broader than the posterior part of the epinotum, with very blunt, rounded superior border and convex anterior and posterior surfaces. Gaster elongate-elliptical, parallel-sided in the middle, as long as the remainder of the body.

Subopaque, finely and indistinctly shagreened; scutellum, epinotum, petiole and bases of gastric segments more shining; mandibles, cheeks and clypeus punctate; mesonotum with a few coarse punctures along the parapsidal furrows. Hairs whitish, short, erect and rather sparse, confined to the head, thorax, abdomen, tips of scapes and femora. Pubescence short, dilute and appressed, distinct on the gaster and legs. Black, like the worker; mandibles, antennæ, wing-insertions, trochanters, bases of tibiæ and terminal tarsal joints, red.

Forel has based a subspecies, *repressus*, of this ant on minor workers from Pará and Bahia, Brazil. They differ from the typical *bidens* in having the pro- and mesonotum narrower, the epinotal teeth shorter, the petiole narrower and less thick, the gaster subopaque and very finely striated instead of finely punctulate-reticulate, with larger, sparse, elongate punctures.

## CAMPONOTUS (MYRMOCLADÆCUS) MUCRONATUS Emery

Emery described this ant from Alajuela, Costa Rica. I have taken it in the same locality. The major workers of my topotypes and one given me by Forel and taken by Touduz from some other Costa Rican locality, agree in lacking erect hairs on the cheeks and clypeus. Since, moreover, Emery says nothing about such hairs in his specimens, I infer that they are absent in the typical form of *mucronatus*.

CAMPONOTUS (MYRMOCLADÆCUS) MUCRONATUS HIRSUTINATUS  
subsp. nov.

*Worker major.* Length 6.3–6.7 mm.

Averaging distinctly larger than the major of the typical *mucronatus*, with longer petiolar spine, more extensively red cheeks, longer, denser erect hairs on the thoracic dorsum, much longer, appressed pubescence on the posterior half of the head and conspicuous, short, stout, erect, obtuse, white hairs on the cheeks and clypeus.

*Worker minor.* Length 5–5.5 mm.

Also averaging somewhat larger than the minor of the typical form, with the pubescence and pilosity on the head similar to those of the major, though the pubescence is even more abundant and the blunt, erect hairs are less numerous on the clypeus than on the cheeks. Spines of the thorax and petiole fully as well developed as in the typical *mucronatus*.

Described from many specimens taken from a number of colonies which I collected during December 1911 in Zacapa (type-locality), Quirigua, Escuintla, Patulul and Panajachel, Guatemala. Dr. Skwarra has sent me three workers of the same subspecies from San Francisco, on the Rio de Carlos, Mexico. Most of the Guatemalan colonies were nesting in dead twigs but at Escuintla a few of them were found inhabiting the large, expanded thorns of an *Acacia* allied to *A. bursaria*.

## CAMPONOTUS (MYRMOCLADÆCUS) MUCRONATUS SANTSCHEI Forel

Forel described this subspecies from the Santa Marta region of Colombia. It differs from the typical *mucronatus* in having the base of the epinotum distinctly convex anteriorly, so that the mesoepinotal impression appears more pronounced. The median spine of the petiole is longer, especially in the worker major, the occiput and gaster are in part shining and more feebly sculptured, the pubescence is some-

what more developed and the head entirely black. I assign to this subspecies a single minor worker which I took at Bella Vista, Panama. The following is a third, very handsome subspecies of *mucronatus*:

CAMPONOTUS (MYRMOCLADÆCUS) MUCRONATUS FORMASTER  
subsp. nov.

*Worker major.* Length 5 mm.

Smaller than the subsp. *hirsutinasus*; very similar in structure and sculpture, but the epinotal and petiolar spines distinctly shorter and less acute, the mesoepinotal impression deeper, the pilosity on the vertex and thorax less abundant and finer and shorter on the gaster; there are no erect hairs on the clypeus and cheeks, which are quite naked; the appressed pubescence on the vertex and occiput very short and delicate. Color very different from that of the preceding forms, being yellowish red, with the mandibular teeth, the sides and more or less of the posterior portion of the pronotal dorsum, the meso- and epinotum, except the spines of the latter, and the petiole, except its spine and ventral portion, black. Hairs and pubescence somewhat paler and less golden than in the other subspecies.

*Worker minor.* Length 3.5 mm.

Very similar to the major, but the epinotal and petiolar spines are longer and less of the anterior portion of the pronotum is red.

Described from two major and four minor workers which I found nesting in a dead twig at Patulul, Guatemala, Jan. 7, 1912.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI Dalla Torre

This interesting ant is imperfectly known and has a confused taxonomic history. In 1870, Mayr erroneously referred the type specimens, which were minima workers from Santa Fe de Bogota, Colombia, to *latangulus* Roger, a very different species. Later (1887) he discovered his error but fell into another by describing the specimens under the name *quadrilaterus*, which happened to be preoccupied by *quadrilaterus* Roger (1863), itself a synonym of an Indian ant, *C. (Tanæmyrmex) compressus* Latreille (1787). Dalla Torre (1892) therefore proposed a new name, *sanctæ-fidei* for Mayr's Colombian species. It seems to be widely distributed in Central and South America. From the literature and the specimens before me at least six variants of it may be recognized. Three of these have been described, namely the subsp. *leonhardi* Forel (1901) from Bolivia, the var. *hondurianus*

Mann (1922) from Honduras and the var. *coronatus* Santschi (1922) from the Alcatraz Islands, São Paulo, Brazil. *Leonhardi* and *coronatus* are based on minima workers, and though Mann had maxima of *hondurianus* he described only the coloration of their legs. Emery (1894) had previously given a brief description of the female and the maxima of what he took to be the typical *quadrilaterus* (*sanctæ-fidei*) from Matto Grosso, Brazil, but his maxima specimen was immature. Since none of the castes has been described in much detail, it is difficult to determine the typical form of the species. I believe, however, that I can recognize it among my material from Central America and British Guiana. My specimens from these and other localities show that the worker is not strongly dimorphic, as Emery seems to have supposed, but trimorphic. There are large and small "soldiers" in the same colony. The smaller ones may be called "mediæ," but unlike the members of this subcaste in many other species of *Camponotus*, they differ much less from the true maxima than from the minima. The three kinds of workers and the winged female of what I regard as the typical form of *sanctæ-fidei* are here described.

*Worker maxima.* Length 4.5-5 mm.

Head suboblong, convex above, one and one-fourth times as long as broad, with somewhat convex posterior border, rectangular anterior and posterior corners and straight, parallel sides, slightly sinuate at the cheeks. Eyes moderately large, flat, distant about their greatest diameter from the posterior corners of the head. Mandibles somewhat flattened above, with very convex external borders, 6-toothed, the three basal teeth short. Clypeus subrectangular, somewhat longer than broad, concave anteriorly, with broadly excised and bluntly bidentate median border; on the posterior half with two large, anteriorly diverging protuberances, which in profile give the clypeus a truncated appearance since each protuberance forms a projecting angle, with its upper or posterior border horizontal and feebly convex, its anterior border concave and perpendicular. Frontal area distinct, trapezoidal; frontal carinae anteriorly approximated, sinuous, diverging behind; frontal groove very distinct. Antennæ rather slender; scapes curved, their tips extending only a distance equal to their greatest diameter beyond the posterior border of the head. Thorax stout, much narrower than the head, but nearly of the same length, including the mandibles, somewhat flattened above and laterally, with sharp promesonotal and mesoepinotal sutures, and a distinct but not very deep impression at the latter. Pronotum less than twice as broad as long, semicircularly rounded in front, laterally



marginate, but without humeral angles; mesonotum transversely elliptical, nearly half again as broad as long; metathoracic spiracles large and prominent; epinotum with feebly convex base, slightly longer than broad, rounded anteriorly, with marginate, parallel sides and the posterior border transverse and distinctly excised in the middle, the posterior corners projecting as short, blunt teeth, the declivity perpendicular, concave, as long as the base. Petiolar scale broader than the epinotum, thick, with rounded superior border and ventrally converging sides, the posterior surface flat, the anterior really consisting of two surfaces meeting at an obtuse angle, the more ventral surface perpendicular, the dorsal sloping upward and backward to the superior border. Gaster elongate-elliptical, parallel-sided in the middle, the first segment anteriorly truncated, with an impression for the accommodation of the petiolar scale. Legs stout, fore femora somewhat incrassated, tibiae clavate, not compressed.

Head, thorax and appendages subopaque, petiole and gaster shining; mandibles rather smooth, sparsely punctate; head and petiole very finely and indistinctly punctulate; thorax, especially on the sides, more coarsely reticulate, or evenly and densely punctate; clypeus and cheeks with shallow punctures; front, especially along the carinae, vertex and thoracic dorsum with large, scattered piligerous punctures, or foveolæ. Gaster very finely shagreened, almost transversely striolate, with sparse, oblique, piligerous punctures.

Hairs sordid white or brownish on the thorax, white on the head and gaster, only moderately long, erect, sparse and rather blunt; short and subappressed on the appendages; pubescence whitish, appressed, short and dilute; almost lacking on the head and thorax, distinct on the gaster.

Black; gaster often very dark brown, with narrow, yellowish margins to the segments; clypeus and cheeks dull red; coxæ, femora and often also the apices of the tibiae, brown; mandibles, except the teeth, antennæ, neck, tips of coxæ, trochanters, tarsi and bases of tibiae brownish yellow; terminal funicular joints infuscated.

*Worker media.* Length 4-4.5 mm.

Differing from the maxima in its distinctly smaller stature and smaller and somewhat shorter head, which has slightly more rounded anterior and posterior corners, slightly less developed protuberances on the posterior half of the clypeus, somewhat more convex eyes, slightly longer antennal scapes, more pronounced and more flattened, lobe-like and longer teeth on the base of the epinotum. The angle between the anterior and dorsal surfaces of the petiole is sharper, so

that the scale has the three surfaces even more distinct than the maxima. Seen from above the petiole is trapezoidal, with straight, anteriorly converging sides and the oblique or dorsal surface transversely convex.

Sculpture, pilosity and color as in the maxima.

*Worker minima.* Length 3-3.5 mm.

Head trapezoidal, as broad or very nearly as broad as long, with distinctly convex posterior border and straight, anteriorly converging sides and carinae extending from the posterior orbits of the convex, posteriorly situated eyes to the occipital border. Mandibles thinner and with much less convex external borders than in the maxima and media, teeth 6 to 7, small, rather crowded. Clypeus of the usual structure, without protuberances, broader than long, convex and carinate in the middle, the anterior border broadly rounded and somewhat projecting. Antennal scapes extending nearly half their length beyond the posterior border of the head. Thorax more flattened above than in the maxima and media; pronotum twice as broad as long with distinct indications of humeral angles; posterior corners of the base of the epinotum developed as flattened, slightly upturned lobe-like teeth, separated by an arcuate, marginate excision; declivity strongly concave. Petiole in profile with the short anterior surface concave and forming a sharp angle with the dorsal surface which is straight or even slightly concave; its sides from above distinctly concave; superior border broad, rather acute, crenulate, produced on each side below as a distinct tooth. Gaster oval, proportionally shorter than in the maxima and media.

Head, and especially the thorax, more sharply and coarsely punctate, the petiole transversely striolate. Pilosity longer and more abundant, pubescence very distinct on the anterior portion of the head and dorsal surface of the thorax and gaster. Black; gaster often paler brown than in the media and maxima; mandibles, anterior border of clypeus and cheeks, antennae and legs, brownish yellow; tips of funiculi and femora darker brown; flexor surfaces of tibiae sometimes brownish.

*Female.* Length 6 mm.

Head shaped as in the worker maxima but with less pronounced anterior and posterior corners and larger and more convex eyes. The mandibles and clypeus are also very similar, but the paired protuberances on the latter are less developed and more like those of the media. Antennal scapes extending twice their greatest diameter beyond the posterior border of the head. Thorax short, about twice as long as

wide; mesonotum slightly flattened, as broad as long; epinotum short, its base convex, sloping backward and forming a distinct angle with the longer, perpendicular and only slightly concave declivity. Petiole shaped as in the maxima but somewhat thicker. Gaster large, elongate-elliptical, as long as the remainder of the body. Wings measuring 6 mm.

Shining; head subopaque, very finely and indistinctly punctulate as in the maxima, with somewhat more shining, punctate mandibles; clypeus and cheeks with small, front with large punctures as in that phase.

Pilosity as in the maxima; pubescence very short, dilute, visible only on the gaster.

Black; mandibles, clypeus and cheeks deep red; palpi and antennæ yellow, the funiculi infuscated distally. Femora dark brown; tibiæ and tarsi paler, more reddish brown. Wings clear, iridescent, with pale brown veins and pterostigma.

Described from two females and numerous workers from Barro Colorado Island and Corozal, Panama. To the same form belong series of maximæ, mediæ and minimæ which I collected from dead twigs at San Jose, Costa Rica and Kartabo, British Guiana, a minima worker from Bartica, British Guiana (W. Beebe) and one from Port of Spain, Trinidad (R. Thaxter).

The peculiar conformation and coloration of the clypeus and anterior portion of the head in the maxima, media and female of this species indicate, I believe, a distinct and independent development of phragmotic habits analogous to those of the soldiers and females in the subgenera *Colobopsis*, *Pseudocolobopsis*, *Manniella*, *Myrmobrachys*, etc.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI var.

HONDURIANUS Mann

Comparison of two cotype maximæ and a minima from Carmelina, Honduras, received from Dr. Mann, and two maximæ and eight minimæ which I collected at Escuintla, Guatemala, with the typical *sanctæ-fidei* reveal few differences. The head of the maxima of *hondurianus* is somewhat larger and distinctly broader in proportion to its length, with distinctly less straight and parallel sides, and the yellow portions of the appendages are clearer yellow and less brownish. This difference in coloration is the only one I can detect between the minimæ of the two forms.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI var.  
CORONATUS Santschi

This form, described as a subspecies, is cited by Emery in the "Genera Insectorum" as a variety, and I am inclined to accept his interpretation. A single minima worker taken by Dr. J. C. Bradley at Esperanza, Amazonas, Brazil, agrees closely with Santschi's description. It is very much like the typical *sanctæ-fidei*, but the gaster and femora are jet black, the distal portions of the tibiæ dark brown, the thorax rather narrow, the pronotum being only one and three-fourths times as broad as long, the epinotum, without its flattened teeth, distinctly longer than broad. The crenulation of the posterior superior border of the petiole is rather coarse, the pilosity on the thorax and gaster rather long and the pubescence on the anterior portion of the head distinct. Santschi devotes most of his description to a comparison of his specimen with *C. (M.) bidens*; which seems to indicate that he had no other specimens of *sanctæ-fidei* with which to compare it. Most of the characters he mentions, including the crenulation of the petiolar border, to which the varietal name seems to allude, are found also in the minima of other forms of the species.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI LEONHARDI Forel

I have not seen this subspecies, which was described from a worker minima from Tipuani, Bolivia (A. von Leonhard). It has the pronotum only a third broader than long and but slightly broader than the mesonotum. The head is less trapezoidal and less narrowed anteriorly than in the typical *sanctæ-fidei*. The appressed pubescence is finer and sparser, the abdomen and legs rather pale brown.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI DARLINGTONI  
subsp. nov.

*Worker minima.* Length about 3.5 mm.

Head trapezoidal, as long as broad, larger and broader anteriorly than in the typical form of the species, eyes not so near the posterior corners, antennal scapes extending only about one-third their length beyond the posterior border. Thorax broader, the teeth of the epinotum much broader and more lobular, as in *C. latangulus*. Petiole decidedly stouter, its dorsal surface distinctly concave above and

laterally, its superior border crenulate, broadly triangular, with a distinct median denticle, as large as that of *C. bidens*, the lateral teeth well-developed, acute.

Dense punctuation of the head, thorax and petiole coarser than in the typical *sanctæ-fidei*, gaster more sharply reticulate. Pilosity on the thorax, and especially on the gaster, more abundant and decidedly longer; appressed pubescence long and sparse, developed on the sides of the head and gaster. Jet black; tibiae and tarsi red; apical halves of middle and hind tibiae dark brown; mandibles and antennae paler, reddish yellow; apical half of funiculi dark brown.

A single specimen taken by Dr. P. J. Darlington in sweepings on Mt. Tucuche, Trinidad, at an altitude of 3070 feet.

CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI CONVEXINODIS

subsp. nov.

*Worker minima.* Length 2.7-3.5 mm.

Head without the mandibles, distinctly broader than long, broad anteriorly, as in *darlingtoni*, but the eyes further back, as in the typical form of the species. Teeth on the epinotum not flattened, longer, stouter and more elevated at their tips, with a much broader excision between their bases. Petiole unlike that of any of the preceding forms of the species and like that of *C. bidens*, the anterior and dorsal surfaces not separated by a ridge but forming in profile a single convex surface, the superior border with a short, acuminate, median tooth like that of *bidens*.

Head, thorax and petiole more opaque than in the typical form and *darlingtoni*, but the sculpture as in the former. Pilosity and pubescence white, the hairs longer and more abundant on the head, thorax and gaster than in any of the preceding forms; pubescence long and sparse, conspicuous over the whole dorsal surface of the head, not appressed but merging into the pilosity. Black; scapes and trochanters yellow; mandibles, borders of cheeks, funiculi, neck and legs reddish yellow; coxæ dark brown; last funicular joint and a streak along the flexor surface of the middle and hind femora brownish.

Described from six specimens taken by Dr. J. C. Bradley at Porto America, Brazil.

This form might, perhaps, be regarded as a distinct species. In the structure of the petiole it closely resembles *C. bidens*, but in most other respects it agrees with *sanctæ-fidei*, and the following variety seems clearly to represent a transition between the two forms.

## CAMPONOTUS (MYRMOCLADÆCUS) SANCTÆ-FIDEI CONVEXINODIS

var. TRANSILIS var. nov.

*Worker minima.* Length 3.5-4.2 mm.

Sculpture and color as in *convexinodis*, but slightly larger, with the sides of the head more convex; superior border of petiole more rounded and less distinctly dentate in the middle; pilosity shorter and like that of the typical *sanctæ-fidei*, but distinctly more abundant; the pubescence on the head short and appressed.

Two workers taken by Dr. P. J. Darlington at St. Augustine, Trinidad.

## CAMPONOTUS (MYRMOCLADÆCUS) CALLISTUS BRADLEYI

subsp. nov.

*Worker minor.* Length about 3.5 mm.

Head subtrapezoidal, without the mandibles broader than long, with broad, nearly straight posterior border, rather sharp posterior corners and anteriorly converging sides, which are sinuate at the level of the eyes and distinctly convex in front. In profile the head is most convex in the middle of the front, with the vertex distinctly, transversely flattened and bordered on each side with a sharp carina from the eye to the occipital border. Eyes rather large, convex, placed distinctly behind the middle of the head. Mandibles with convex external borders, 6-toothed, the three basal teeth short. Clypeus large, convex in the middle, narrow and depressed laterally, its median anterior border broadly rounded and entire. Frontal area large, trapezoidal, twice as broad as long; frontal carinae not closely approximated, straight and subparallel anteriorly, arcuate and diverging behind; frontal groove short and tenuous. Antennae long and stout; scapes reaching about two-fifths of their length beyond the posterior border of the head. Thorax narrower than the head, very broad through the pronotum; promesonotal suture impressed; mesoëpinal impression very deep, wide at the sides, where the large, projecting metanotal spiracles are situated. Pronotum somewhat less than twice as broad as long, flattened above, semicircularly rounded in front, sides straight and subparallel in the middle, converging behind, the anterior and lateral borders marginate; mesonotum sloping, about one and one-half times as broad as long, broader in front, semicircularly rounded behind, the sides marginate, as are also those of the epinotum, the base of which is somewhat longer than broad, anteriorly sub-

triangular, sloping upward and backward, posteriorly more parallel-sided, except for a short, blunt projection on each side; posterior border arcuately excised and bearing at each corner a horn-like spine, which is stout and flattened at the base and turned somewhat outward and upward, produced apically as a somewhat shorter, more slender, blunt and terete extension, which is turned inward and upward. Declivity of epinotum concave, perpendicular, scarcely more than half as long as the base; sides of pronotum concave, meso- and metapleuræ flattened. Petiole large and thick, shaped like that of *C. sanctæ-fidei*, in profile with the anterior and posterior surfaces straight and perpendicular, the dorsal surface very feebly concave, sloping upward to the superior border, which, seen from behind is acute, arcuately rounded, indistinctly crenulate, bilobulate in the middle above and on each side below produced as a straight, blunt, spine, which is nearly twice as long as broad at its base. From above the petiole is broader than the epinotum, subtrapezoidal, with straight anterior and posterior borders and concave, anteriorly converging sides. Gaster small, rounded-subquadrate, nearly as broad as long. Legs very long and stout.

Mandibles, head, sides of pronotum, apical portion of epinotal spines, ventral portion of epinotal declivity, gaster and legs very smooth and shining, with fine, sparse, piligerous punctures. Dorsal surface of thorax, meso- and metapleuræ and petiole opaque, coarsely, evenly and closely punctate, the punctures becoming finer at the anterior end of the pronotum.

Hairs moderately abundant, pale yellow, erect, very fine and long, even on the tips of the epinotal spines, shorter on the scapes and legs; pubescence undeveloped, except on the funiculi.

Mandibular teeth, thorax and petiole black; head, sides and anterior border of pronotum, apical portion of epinotal spines, superior border of petiole, gaster, antennæ and legs, including the coxæ, bright yellowish red; knees somewhat brownish.

A single specimen taken by Dr. J. C. Bradley at El Campamiento, Perene, Peru.

This beautiful specimen agrees very closely with Emery's description of the typical *callistus*, of which he had major, minor and female specimens from Mapiri, Bolivia, but the Peruvian specimen is decidedly smaller (the minor of *callistus* measures 4.5 mm.) and seems to have a differently shaped petiole. This segment Emery described as "très épaisse, avec une face dorsale bombée, declive en avant, plus étroite devant que derrière et dont le bord antérieur (qui constitue

proprement la tranche de l'écaïlle) est arqué et se prolonge de chaque coté par une épine courte, presque horizontale." Certainly the words "bombée" and "declive en avant" do not apply to the dorsal and anterior petiolar surfaces of the Peruvian specimen, and the border which Emery describes as "antérieur" (apparently my "superior border," homologous with the simple superior petiolar border in most species of *Camponotus*) is actually posterior. Perhaps, however, "antérieur" is a *lapsus calami* for "postérieur."

CAMPONOTUS (MYRMOCLADÆCUS) CORNICULATUS sp. nov.

*Worker maxima.* Length 3.3 mm. (Fig. 6 a-c.)

Head subrectangular, distinctly longer than broad, somewhat narrower in front than behind, with very feebly convex posterior border, straight sides and slightly rounded cheeks; posterior and anterior corners not sharp; in profile the anterior surface of the head is subtruncate, the dorsal surface convex. There are no ridges from the eyes to the posterior corners. Eyes large, moderately convex, as long as their distance from the posterior border of the head. Mandibles stout, somewhat geniculate at the base, with very convex external borders and five acute teeth, the basal four well-developed. Clypeus large, subquadrate, flat, nearly as long as broad, surrounded by a deep suture; behind and parallel with its raised lateral borders there is on each side a blunt longitudinal, ridge-like projection, corresponding to the more pronounced protuberance in *C. sanctæ-fidei*. Anterior border of clypeus straight in the middle, forming a short transverse lobe, because it is rather deeply excised on each side. Frontal area distinct, trapezoidal, fully twice as broad as long; anterior halves of frontal carinæ straight and strongly diverging, posterior halves straight and slightly converging behind; frontal groove distinct. Antennæ rather stout; scapes extending twice their greatest diameter beyond the posterior border of the head. Thorax stout; pronotum large, excluding the neck twice as broad as long, flattened in the middle, semicircularly rounded anteriorly, the sides only bluntly marginate; mesonotum very regularly elliptical, nearly one and one-half times as broad as long, raised above the posterior end of the pronotum anteriorly and especially at the sides which are bluntly marginate, its surface flattened, sloping backward and downward to the long and deep mesoëpinotal impression, bearing the large, prominent metathoracic spiracles, which are separated by a distance equal to twice the length of the impression. Base of epinotum rising very



abruptly above the impression to the height of the promesonotum and forming a trapezoidal plate, broader behind than in front, with straight, submarginate anterior and lateral borders and broadly excised posterior border, the corner of which are produced backwards as short, flattened, distinctly in-turned lobes; declivity steeply sloping

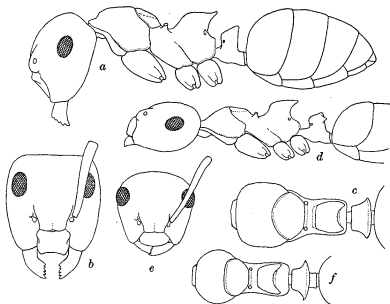


Fig. 6. *Camponotus* (*Myrmocladæcus*) *corniculatus* sp. nov. of British Guiana. a, worker maxima in profile; b, head of same, dorsal aspect; c, thorax and petiole of same, dorsal aspect; d, worker minima in profile; e, head of same, dorsal aspect; f, thorax and petiole of same, dorsal aspect.

and deeply concave, as long as the base. Petiole shaped much as in *sanctæ-fidei*; from above trapezoidal, twice as broad as long, with straight anterior, posterior and anteriorly converging lateral borders, the posterior corners acute; in profile the anterior surface is slightly concave, forming a distinct angle with the dorsal surface which is transversely convex and slopes upward and backward to the rather blunt, narrow and transversely rounded superior border, which terminates on each side in a sharp, tooth-like angle, the sides of the border concave, converging inferiorly. The petiole has a short but distinct

posterior extension or peduncle. Gaster rather large, oval, broader in front than behind, the anterior surface of the first segment rounded, with a very distinct articular condyle but without a median impression for the accommodation of the petiolar scale. Legs rather long, fore femora somewhat enlarged.

Shining; finely coriaceous; mesonotum, mesopleuræ, metapleuræ and petiole more coarsely, almost reticulate rugulose, the base of the epinotum somewhat longitudinally, the dorsal surface of the petiole transversely, striate. Mandibles indistinctly shagreened, with fine piligerous punctures; clypeus, cheeks and front with coarse, shallow, sparse punctures; gaster very finely and transversely coriaceous, and like the posterior portion of the head, the promesonotum, legs and scapes with sparse piligerous punctures.

Hairs yellowish, abundant, rather coarse, of uneven length, long and erect on the head, thorax and gaster, shorter and more oblique on the scapes and legs, where they are most numerous on the extensor surfaces; on the cheeks and clypeus short and blunt; pubescence undeveloped.

Brownish yellow; mandibular teeth, posterior two-thirds of head, the mesonotum, mesopleuræ, base of epinotum and anterior half of metapleuræ and the petiole, except its ventral surface, deep piceous brown; gaster, extensor surfaces of femora and some irregular spots on the pronotum, paler brown.

*Worker media.* Length 3 mm.

Very similar to the maxima, but the head is smaller and very nearly as broad as long. Clypeus similar but subcarinate at the base and with the posterolateral ridges slightly less developed. Antennal scapes longer, extending about one-fourth their length beyond the posterior border of the head. Pronotum smaller and narrower, the base of the epinotum distinctly concave above, with its lateral borders more elevated, the posterior excision deeper and the lobes more acute and dentiform, with more pronounced inward curvature. Petiole very similar to that of the maxima but the sides are more concave and the teeth at the lateral corners of the superior border are more distinct.

Sculpture, pilosity and color much as in the maxima, but less distinctly coriaceous, the erect hairs on the thorax longer and more abundant, those on the cheeks and clypeus shorter and more appressed; yellow portions of head confined to the mandibles, clypeus and anterior borders of cheeks.

*Worker minima.* Length 2.2-2.5 mm. (Fig. 6 d-f.)

Resembling the media, but the head is much smaller and, without the mandibles, not longer than broad, with the sides more converging anteriorly and smaller, more convex and more posteriorly situated eyes. Clypeus trapezoidal, broader in front than behind, very convex and distinctly carinate in the middle, without posterolateral ridges, its anterior border broad, entire, feebly sinuate on each side. Scapes extending about two-fifths their length beyond the posterior border of the head. Thorax, with laterally sharply marginate pro-, meso- and epinotum; pronotum not more than one and one-half times as broad as long, flattened above; mesonotum also very flat, sloping backward and downward and forming an obtuse angle with the pronotum in profile; epinotum horizontal, more concave above than in the media with more elevated, convex and anteriorly converging sides, so that it appears crescentic and with more acute inwardly curved posterior teeth; in profile the base rises above the highest level of the promesonotum so that the declivity is longer, steeper and more concave. Petiole much as in the media but the sides even more concave, the dentate corners of the superior border more pronounced and the posterior peduncle-like extension somewhat longer. Legs and antennae longer; gaster shorter.

Sculpture finer; surface of body smooth and shining with fine, sparse, piligerous punctures; only the gaster distinctly coriaceous. Pilosity proportionally longer, especially on the thorax; cheeks with ordinary, sparse, pointed hairs, some of which are appressed as in the media. Color much as in the maxima and media but the pronotum darker brown above and the yellow portions of the head and thorax more brownish.

*Female.* Length 5.5–6 mm.

Head very similar to that of the maxima, but the eyes are larger and more convex, the clypeus broader and more hexagonal, with the posterolateral ridges well-developed. Antennal scapes extending three times their greatest diameter beyond the posterior corners of the head. Thorax of the usual shape in *Camponotus* females, subelliptical from above, more than twice as long as broad; mesonotum as broad as long, epinotum short, convex, slightly sloping, the declivity of about the same length, abrupt, very concave, the incurved teeth of the worker forms represented by a pair of blunt, feeble protuberances. Petiole resembling that of the maxima but higher and broader, the boundary between its anterior and dorsal surfaces more rounded, the latter transversely convex, the superior border bluntly angular and produced upward in the middle, without lateral teeth; the sides

straight. Gaster large, elongate-elliptical, parallel-sided in the middle. Wings very short, measuring only 4 mm.

Smooth and shining; finely but distinctly coriaceous like the maxima, with scattered piligerous punctures; meso- and metapleuræ and petiole more opaque and more coarsely coriaceous, the petiole regularly transversely striate. Coarse punctures on the cheeks, clypeus and front and the pilosity as in the maxima. Dark piceous brown; mandibles, clypeus, anterior borders of cheeks, antennæ, middle and hind coxæ and trochanters and ventral portion of petiole brownish yellow; pronotum and legs pale brown; the middle and hind femora and tibiæ darker; wing-insertions and posterior borders of gastric segments sordid yellow. Wings rather opaque, whitish, with brownish yellow veins and pterostigma.

Described from 23 specimens (a maxima, a media, 16 minimæ and five females) taken by Mr. H. O. Lang at Kurupung, British Guiana, Nov. 1922, from a single colony nesting in a hollow twig.

This ant is, perhaps, only a subspecies of *C. hippocrepis*, described by Emery (1920) from a single defective minima taken by Balzan at Salinas sul Beni, Bolivia. Emery's figure and brief description agree with my specimens, except in indicating that *hippocrepis* has a much shorter and shallower mesoëpinotal impression and differently shaped petiolar scale. The latter is described as depressed, with the dorsal surface broad and flat. Furthermore, the frontal carinæ of *corniculatus* are neither widely separated nor parallel, as in Emery's species. Both species are closely related to *C. raphaelis* Forel of Costa Rica, which I know only from the original description. Like *sanctæ-fidei*, the maxima of *corniculatus* shows in the shape of its head a significant approximation to certain species of the subgenus *Colobopsis*.